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ROYAL COMMISSION
ON
AGRICULTURE IN INDIA

VOLUME V

EVIDENCE

TAKEN IN

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CALCUTTA: GOVERNMENT OF INDIA
CENTRAL PUBLICATION BRANCH
1927

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INTERIM REPORT

To

THE KING'S MOST EXCELLENT MAJESTY.

May It Please Your Majesty,

We, the Commissioners appointed to examine and report on the present conditions of agricultural and rural economy in British India, and to make recommendations for the improvement of agriculture and to promote the welfare and prosperity of the rural population; in particular to investigate :—(a) the measures now being taken for the promotion of agricultural and veterinary research experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock; (b) the existing methods of transport and marketing of agricultural produce and stock; (c) the methods by which agricultural operations are financed and credit afforded to agriculturists; (d) the main factors affecting rural prosperity and the welfare of the agricultural population; and to make recommendations; availing ourselves of Your Majesty's permission to report our proceedings from time to time, desire to submit to Your Majesty the minutes of the evidence which we have taken up to the 19th of December 1926 on the subject of our Inquiry.

All of which we most humbly submit for Your Majesty's most gracious consideration.

(Signed) LINLITHGOW,

Chairman.

(„) H. S. LAWRENCE.

(„) T. H. MIDDLETON.

(„) J. MACKENNA.

(„) H. CALVERT.

(„) N. GANGULEE.

(„) L. K. HYDER.

(„) B. S. KAMAT.

(Signed) J. A. MADAN,

(„) F. W. H. SMITH,

Joint Secretaries. (A)

7th June 1927.

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TERMS OF REFERENCE

Generally,

To examine and report on the present conditions of agriculture and rural economy in British India and to make recommendations for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population ;

In particular to investigate—

- (a) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock ;
- (b) the existing methods of transport and marketing of agricultural produce and stock ;
- (c) the methods by which agricultural operations are financed and credit afforded to agriculturists ;
- (d) the main factors affecting rural prosperity and the welfare of the agricultural population ;

and to make recommendations.

It will not be within the scope of the Commission's duties to make recommendations regarding the existing system of landownership and tenancy or of the assessment of land revenue and irrigation charges, or the existing division of functions between the Government of India and the local Governments. But the Commission shall be at liberty to suggest means whereby the activities of the Governments in India may best be co-ordinated and to indicate directions in which the Government of India may usefully supplement the activities of local Governments.

QUESTIONNAIRE

PART I

Question.

1. Research.
2. Agricultural education.
3. Demonstration and propaganda.
4. Administration.
5. Finance.
6. Agricultural indebtedness.
7. Fragmentation of holdings.

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21. Tariffs and sea freights.
22. Co-operation.
23. General education.
24. Attracting capital.
25. Welfare of rural population.
26. Statistics.

QUESTIONNAIRE

PART I

1. Research.

(a) Have you suggestions to advance for the better organisation, administration and financing of—

(i) All research affecting the welfare of the agriculturist, including research into the scientific value of the indigenous theory and traditional methods of agriculture,

(ii) Veterinary research ?

(b) If in cases known to you progress is not being made because of the want of skilled workers, or field or laboratory facilities for study or by reason of any other handicaps, please give particulars. [Suggestions of a general kind should be made under (a) ; answers under this heading should relate to specific subjects. The purpose is to secure a list of the problems met with by scientific investigators in the course of their work which are being held over because of lack of resources or deficient organisation.]

(c) Can you suggest any particular subject for research not at present being investigated to which attention might usefully be turned ?

2. Agricultural Education.

With reference to any form of agricultural education of which you may have experience, please state your views on the following :—

(i) Is the supply of teachers and institutions sufficient ?

(ii) Is there an urgent need for extension of teaching facilities in any district or districts known to you personally ?

(iii) Should teachers in rural areas be drawn from the agricultural classes ?

(iv) Are the attendances at existing institutions as numerous as you would expect in present circumstances ; if not, state reasons. Can you suggest measures likely to stimulate the demand for instruction ?

(v) What are the main incentives which induce lads to study agriculture ?

(vi) Are pupils mainly drawn from the agricultural classes ?

(vii) Are there any modifications in existing courses of study which appear to be called for ; if so, what are they ?

(viii) What are your views upon (a) nature study ; (b) school plots ; (c) school farms ?

(ix) What are the careers of the majority of students who have studied agriculture ?

(x) How can agriculture be made attractive to middle class youths ?

(xi) Are there recent movements for improving the technical knowledge of students who have studied agriculture ?

- (xii) How can adult education in rural tracts be popularised ?
- (xiii) In suggesting any scheme for better educational facilities in rural areas, please give your views for (a) its administration and (b) its finance.

3. Demonstration and Propaganda.

- (a) What are the measures which in your view have been successful in influencing and improving the practice of cultivators ?
- (b) Can you make suggestions for increasing the effectiveness of field demonstrations ?
- (c) Can you suggest methods whereby cultivators may be induced to adopt expert advice ?
- (d) If you are aware of any striking instances of the success or the failure of demonstration and propaganda work, please give particulars and indicate the reasons for success or for failure.

4. Administration.

- (a) Do you wish to suggest means towards the better co-ordination of the activities of the Governments in India or to indicate directions in which the Government of India may usefully supplement the activities of the local Governments ?
- (b) Is it your opinion that the expert scientific knowledge required in the development of agriculture in the different Provinces could be supplied to a greater extent than is the case at present by increasing the scientific staff of the Government of India ? If so, indicate the types of work which would benefit by pooling the services of experts, and suggest how that work should be controlled.

(c) Are you satisfied from the agricultural standpoint with the services afforded by—

- (i) The Agricultural and Veterinary Services,
- (ii) Railways and steamers,
- (iii) Roads,
- (iv) Meteorological Department,
- (v) Posts, and
- (vi) Telegraphs, including wireless ?

If not, please indicate directions in which you think these Services might be improved or extended.

5. Finance.

- (a) What are your views as to the steps that should be taken for the better financing of agricultural operations and for the provision of short and long-term credit to cultivators ?
- (b) Do you wish to suggest means whereby cultivators may be induced to make fuller use of the Government system of *taccavi* ?

6. Agricultural Indebtedness.

- (a) What in your opinion are :—
 - (i) the main causes of borrowing,
 - (ii) the sources of credit, and
 - (iii) the reasons preventing repayment.

(b) What measures in your opinion are necessary for lightening agriculture's burden of debt? For example, should special measures be taken to deal with rural insolvency, to enforce the application of the Usurious Loans Act, or to facilitate the redemption of mortgages?

(c) Should measures be taken to restrict or control the credit of cultivators such as limiting the right of mortgage and sale? Should non-terminable mortgages be prohibited?

7. Fragmentation of Holdings.

(a) Do you wish to suggest means for reducing the loss in agricultural efficiency attendant upon the excessive subdivision of holdings?

(b) What are the obstacles in the way of consolidation and how can they be overcome?

(c) Do you consider legislation to be necessary to deal with minors widows with life interest, persons legally incapable, alienation and dissentients, and to keep disputes out of the courts?

PART II

8. Irrigation.

(a) Name any district or districts in which you advocate the adoption of new irrigation schemes, or suggest extensions or improvements in the existing systems or methods of irrigation by—

- (i) Perennial and non-perennial canals,
- (ii) Tanks and ponds,
- (iii) Wells.

What are the obstacles in your district or Province to the extension of irrigation by each of the above methods?

(b) Are you satisfied with the existing methods of distributing canal water to cultivators? Describe the methods that have been employed to prevent wastage of water by evaporation and by absorption in the soil. What form of outlet for distribution to cultivators at the tail end do you regard as the most equitable and economical? Have these methods and devices been successful, or do you wish to suggest improvements?

(N.B.—Irrigation charges are *not* within the terms of reference of the Commission, and should not be commented upon.)

9. Soils.

(a) Have you suggestions to make—

- (i) for the improvement of soils, whether by drainage or other means, not dealt with under other headings in this questionnaire.
- (ii) for the reclamation of Alkali (Usar) or other uncultivable land,
- (iii) for the prevention of the erosion of the surface soil by flood water?

(b) Can you give instances of soils known to you which, within your recollection, have—

- (i) undergone marked improvement,
- (ii) suffered marked deterioration?

If so, please give full particulars.

(c) What measures should Government take to encourage the reclamation of areas of cultivable land which have gone out of cultivation ?

10. Fertilisers.

(a) In your opinion, could greater use be profitably made of natural manures or artificial fertilisers ? If so, please indicate the directions in which you think improvement possible.

(b) Can you suggest measures to prevent the fraudulent adulteration of fertilisers ?

(c) What methods would you employ to popularise new and improved fertilisers ?

(d) Mention any localities known to you in which a considerable increase in the use of manures has recently taken place.

(e) Has effect of manuring with phosphates, nitrates, sulphate of ammonia, and potash manures been sufficiently investigated ? If so, what is the result of such investigation ?

(f) What methods would you employ to discourage the practice of using cowdung as fuel ?

11. Crops.

(a) Please give your views on—

(i) the improvement of existing crops,

(ii) the introduction of new crops including fodder crops,

(iii) the distribution of seeds,

(iv) the prevention of damage by wild animals.

(b) Can you suggest any heavy yielding food crops in replacement of the present crops ?

(c) Any successful efforts in improving crops or substituting more profitable crops which have come under your own observation should be mentioned.

12. Cultivation.

Can you suggest improvements in—

(i) the existing system of tillage, or

(ii) the customary rotations or mixtures of the more important crops ?

13. Crop Protection, Internal and External.

Please give your views on—

(i) The efficacy and sufficiency of existing measures for protection of crops from external infection, pests and diseases.

(ii) The desirability of adopting internal measures against infection.

14. Implements.

(a) Have you any suggestion for the improvement of existing, or the introduction of new, agricultural implements and machinery ?

(b) What steps do you think may usefully be taken to hasten the adoption by the cultivator of improved implements ?

(c) Are there any difficulties which manufacturers have to contend with in the production of agricultural implements or their distribution for sale throughout the country? If so, can you suggest means by which these difficulties may be removed?

PART III

15. Veterinary.

(a) Should the Civil Veterinary Department be under the Director of Agriculture or should it be independent?

(b) (i) Are dispensaries under the control of Local (District) Boards? Does this system work well?

(ii) Is the need for expansion being adequately met?

(iii) Would you advocate the transfer of control to Provincial authority?

(c) (i) Do agriculturists make full use of the veterinary dispensaries? If not, can you suggest improvements to remedy this?

(ii) Is full use made of touring dispensaries?

(d) What are the obstacles met with in dealing with contagious diseases? Do you advocate legislation dealing with notification, segregation, disposal of diseased carcasses, compulsory inoculation of contacts and prohibition of the movement of animals exposed to infection? Failing legislation, can you suggest other means of improving existing conditions?

(e) Is there any difficulty in securing sufficient serum to meet the demand?

(f) What are the obstacles in the way of popularising preventive inoculation? Is any fee charged, and, if so, does this act as a deterrent?

(g) Do you consider that the provision of further facilities for research into animal disease is desirable?

If so, do you advocate that such further facilities should take the form of—

(i) an extension of the Muktesar Institute, or

(ii) the setting up, or extension of, Provincial Veterinary Research Institutions?

(h) Do you recommend that special investigations should be conducted by—

(i) officers of the Muktesar Institute, or

(ii) research officers in the Provinces?

(i) Do you recommend the appointment of a Superior Veterinary Officer with the Government of India? What advantages do you expect would result from such an appointment?

16. Animal Husbandry.

(a) Do you wish to make suggestions for—

(i) improving the breeds of livestock,

(ii) the betterment of the dairying industry,

(iii) improving existing practice in animal husbandry?

(b) Comment on the following as causes of injury to cattle in your district—

- (i) Overstocking of common pastures,
 - (ii) Absence of enclosed pastures, such as grass borders in tilled fields,
 - (iii) Insufficiency of dry fodder such as the straw of cereals or the stems and leaves of pulses,
 - (iv) Absence of green fodders in dry seasons,
 - (v) Absence of mineral constituents in fodder and feeding stuffs.
- (c) Please mention the months of the year in which fodder shortage is most marked in your district. For how many weeks does scarcity of fodder usually exist? After this period of scarcity ends how many weeks elapse before young growing cattle begin to thrive?
- (d) Can you suggest any practicable methods of improving or supplementing the fodder supply that would be applicable to your district?
- (e) How can landowners be induced to take a keener practical interest in these matters?

PART IV

17. Agricultural Industries.

(a) Can you give any estimate of the number of days of work done by an average cultivator on his holding during the year? What does he do in the slack season?

(b) Can you suggest means for encouraging the adoption of subsidiary industries? Can you suggest any new subsidiary industries to occupy the spare time of the family which could be established with Government aid?

(c) What are the obstacles in the way of expansion of such industries as beekeeping, poultry rearing, fruit growing, sericulture, pisciculture, lac culture, rope making, basket making, etc.?

(d) Do you think that Government should do more to establish industries connected with the preparation of agricultural produce for consumption, such as oil pressing, sugar making, cotton ginning, rice hulling, utilisation of wheat straw for card-board, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc.?

(e) Could subsidiary employment be found by encouraging industrial concerns to move to rural areas? Can you suggest methods?

(f) Do you recommend a more intensive study of each rural industry in its technical, commercial and financial aspects, with a view to, among other things, introduction of improved tools and appliances?

(g) Can you suggest any other measures which might lead to greater rural employment?

(h) Can you suggest means whereby the people could be induced to devote their spare time to improving the health conditions of their own environment?

18. Agricultural Labour.

(a) What measures, if any, should be taken to attract agricultural labour from areas in which there is a surplus to—

(i) areas under cultivation in which there is a shortage of such labour ?
and

(ii) areas in which large tracts of cultivable land remain uncultivated ?

Please distinguish between suggestions designed to relieve seasonal unemployment and proposals for the permanent migration of agricultural population.

(b) If there is any shortage of agricultural labour in your Province, what are the causes thereof and how could they be removed ?

(c) Can you suggest measures designed to facilitate the occupation and development, by surplus agricultural labour, of areas not at present under cultivation ?

19. Forests.

(a) Do you consider that forest lands as such are at present being put to their fullest use for agricultural purposes ? For instance, are grazing facilities granted to the extent compatible with the proper preservation of forest areas ? If not, state the changes or developments in current practice which you consider advisable.

(b) Can you suggest means whereby the supply of firewood and fodder in rural areas may be increased ?

(c) Has deterioration of forests led to soil erosion ? What remedies would you suggest for erosion and damage from floods ?

(d) Can you indicate any methods by which supply of moisture in the soil, the rainfall and supply of canal water can be increased and regulated by afforestation or by the increased protection of forests so as to benefit agriculture ? Would the same methods be useful in preventing the destruction by erosion of agricultural land ?

(e) Is there an opening for schemes of afforestation in the neighbourhood of villages ?

(f) Are forests suffering deterioration from excessive grazing ? Is soil erosion being thereby facilitated ? Suggest remedies.

20. Marketing.

(a) Do you consider existing market facilities to be satisfactory ? Please specify and criticise the markets to which you refer, and make suggestions for their improvement.

(b) Are you satisfied with the existing system of marketing and distribution ? If not, please indicate the produce to which you refer and describe and criticise in detail the channels of marketing and distribution from the producer to the consumer in India (or exporter in the case of produce exported overseas). State the services rendered by each intermediary and whether such intermediary acts in the capacity of merchant or commission agent, and comment upon the efficiency of these services and the margins upon which such intermediaries operate. Please describe

the method by which each transaction is financed, or in the case of barter, by which an exchange is effected.

(c) Do you wish to suggest steps whereby the quality, purity, grading or packing of agricultural produce may be improved, distinguishing where possible between produce destined for—

(i) Indian markets ?

(ii) Export markets ?

(d) Do you think that more effective steps might be taken to place at the disposal of cultivators, merchants and traders information as to market conditions, whether Indian or overseas ; crop returns ; complaints as to Indian produce from wheresoever originating ; and agricultural and marketing news in general ?

21. Tariffs and Sea Freights.

Do existing (a) customs duties, both import and export, and (b) sea freights adversely affect the prosperity of the Indian cultivator ? If so, have you any recommendations to make ?

22. Co-operation.

(a) What steps do you think should be taken to encourage the growth of the co-operative movement—

(i) by Government,

(ii) by non-official agencies ?

(b) Have you any observations to make upon—

(i) Credit societies ;

(ii) Purchase societies ;

(iii) Societies formed for the sale of produce or stock ;

(iv) Societies for effecting improvements—*e.g.*, the digging of wells and the construction of bunds, walls and fences, or the planting of hedges ;

(v) Societies formed for the aggregation of fragmented holdings and their redistribution in plots of reasonable size ;

(vi) Societies for the co-operative use of agricultural machinery ;

(vii) Societies for joint farming ;

(viii) Cattle breeding societies ;

(ix) Societies formed for any purpose connected with agriculture or with the betterment of village life, but not specified above ?

(c) Where co-operative schemes for joint improvement, such as co-operative irrigation or co-operative fencing or a co-operative consolidation of holdings scheme, cannot be given effect to owing to the unwillingness of a small minority to join, do you think legislation should be introduced in order to compel such persons to join for the common benefit of all ?

(d) Do you consider that those societies of which you have personal knowledge have, in the main, achieved their object ?

23. General Education.

(a) Do you wish to make observations upon existing systems of education in their bearing upon the agricultural efficiency of the people? If you make suggestions, please distinguish, as far as possible, between—

- (i) Higher or collegiate,
- (ii) Middle school, and
- (iii) Elementary school education.

(b) (i) Can you suggest any methods whereby rural education may improve the ability and culture of agriculturists of all grades while retaining their interest in the land?

(ii) What is your experience of compulsory education in rural areas?

(iii) What is the explanation of the small proportion of boys in rural primary schools who pass through the fourth class?

24. Attracting Capital.

(a) What steps are necessary in order to induce a larger number of men of capital and enterprise to take to agriculture?

(b) What are the factors tending to discourage owners of agricultural land from carrying out improvements?

25. Welfare of Rural Population.

(a) Outside the subjects enumerated above, have you any suggestions to offer for improving hygiene in rural areas and for the promotion of the general well-being and prosperity of the rural population?

(b) Are you, for instance, in favour of Government conducting economic surveys in typical villages with a view to ascertaining the economic position of the cultivators? If so, what, in your opinion, should be the scope and methods of such enquiries?

(c) If you have carried out anything in the nature of such intensive enquiry, please state the broad conclusions which you reached.

26 Statistics.

(a) Do you wish to make suggestions for the extension or improvement of the existing methods of—

- (i) ascertaining areas under cultivation and crops;
- (ii) estimating the yield of agricultural produce;
- (iii) enumerating livestock and implements;
- (iv) collecting information on land tenure, the incidence of land revenue and the size of the agricultural population;
- (v) arranging and publishing agricultural statistics?

(b) Have you any other suggestions to make under this heading?

MINUTES OF EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION ON AGRICULTURE.

Monday, December 13th, 1926.

SHILLONG.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S. Sir THOMAS MIDDLETON, K.B.E., C.B. Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.	Mr. H. CALVERT, C.I.E., I.C.S. Professor N. GANGULEE. Dr. L. K. HYDER. Mr. B. S. KAMAT.
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Mr. J. HEZLETT, I.C.S. Rai Bahadur RAMANI MOHAN DAS. Mr. J. A. MADAN, I.C.S. Mr. F. W. H. SMITH.	} (<i>Co-opted Members</i>). } (<i>Joint Secretaries</i>).
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**Rai Bahadur K. L. BARUA, B.L., Director of Agriculture
and Industries and Registrar of Co-operative
Societies, Assam.**

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (i) For better organisation of agricultural scientific research work in Assam we must have an adequate and capable staff. At present the only superior officer in the scientific staff is the Botanist who is a member of the Indian Agricultural Service. The assistants in the chemical and entomological sections are members of the Sub-ordinate Service. We have no mycological expert to study plant diseases.

In my opinion, all research for the welfare of the agriculturists must have a definite practical end in view. It must always be remembered by those engaged in researches that the agriculturists will not give up the indigenous theory or practice of agriculture unless striking improvements are demonstrated in such a way as to leave no room for doubting the value of such improvements. Further, the improvements suggested should

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be attainable without much alteration of the methods to which the agriculturists are accustomed and with expenditure of a reasonable amount of labour and money. In other words, the improvements must not be beyond their means. The conservatism of agriculturists throughout India is well known. The task of the department in popularising improvements in a Province like Assam where the pressure on the soil is yet light, the natural fertility of the soil is yet good enough and the climatic conditions are favourable, must necessarily be more uphill.

(b) In my opinion, we should have a Chemist, an Entomologist, a Mycologist and a Livestock Expert, all belonging to the Provincial Service. They should be at least men who have undergone post-graduate training at Pusa. They should hold independent charges of their own sections and not work under the control of the Botanist as at present.

The botanical staff which now consists of the Economic Botanist with two botanical assistants, two field assistants and two field men for the two rice farms is adequate and the only scientific work of any value is being done in this section.

(c) The following subjects require to be studied:—

- (1) What improved implements are suited to the soil, climate, condition of the draught animals and economic position of the agriculturists in Assam.
- (2) What can be done to improve the methods of packing and transit of oranges, pine-apples and potatoes to distant places.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) to (vii) There are no institutions in Assam for teaching agriculture. No attempt has yet been made to introduce agricultural education into our elementary or middle schools.

(viii) We are trying to teach improved methods to agriculturists by means of ocular demonstrations in their own fields but, in my opinion, this is not enough. We should combine this method with a system of education in the theory and practice of agriculture at least in middle schools. Nature study should certainly form a part of such education. School farms will perhaps be too costly to begin with. I would, therefore, advocate school plots not merely for growing flowers or English vegetables, but for growing some of our important crops such as rice, jute, sugarcane and mustard. Such school plots may be periodically visited by our Agricultural Inspectors and teachers may be made to undergo training for at least one year in our experimental farms as apprentices. Local Boards who are now charged with rural education should maintain such apprentices in our farms with stipends.

(ix) We now send students to Agricultural Colleges in other Provinces with stipends and we have to pay per head of such students a monthly contribution to other Provincial Governments. These students after passing out of the college are appointed to the Subordinate Agricultural Service. One or two have started individual private farms of their own.

(x) By demonstrating that scientific agriculture is a paying proposition. This will be demonstrated better by the pioneers who are now on the field and we must do all we can to assist them at this stage to make them successful.

(xi) There is none in this Province but I should think arrangements should be made for practical training of our officers at Pusa sent on short deputation.

(xii) In convenient places, night schools may be established where lantern lectures on co-operation, cattle keeping, dealing with insect pests, etc., may be delivered at least once a week by the local Agricultural Inspector. Greater attention of the departmental staff to agricultural education will necessarily require reduction of each Inspector's area of operation and consequent increase of the number of Inspectors and of the superior staff for supervision.

(xiii) (a) The administration should certainly rest with the Department of Education though I know there are some people who think that rural education should be made over *en bloc* to the Agricultural Department.

(b) The finances should, as at present, be supplied by the Local Boards assisted by Government. A greater portion of money now spent on high education may be profitably diverted to rural education.

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QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) Demonstration in the cultivators' own fields.

(b) (i) Demonstration farms should be established in each sub-division, (ii) District Agricultural Associations should be formed and (iii) co-operative demonstration centres may be tried.

(c) Educated or middle-class farmers may be expected to follow expert advice and introduce scientific cultivation. If such farmers prove successful their example may be followed by ordinary cultivators. It is, therefore, essentially necessary to assist and encourage such farmers.

(d) Departmental seeds of potatoes, paddy and jute have become strikingly popular. Similarly our three-roller sugarcane crushing mill is very popular. Successful introduction of bonemeal as fertiliser of paddy in the hills is another instance.

We introduced sugarcane of high-yielding varieties but subject to depredations of jackals. These were very popular at the beginning owing to high yields, but they are not wanted now as they are an easy prey to jackals.

QUESTION 4.—ADMINISTRATION.—(a) & (b) I will answer these questions rather generally.

All Provinces have not the same agricultural conditions and the same problems have not to be faced in each Province. Each Province should therefore have its own scientific branch properly developed. The Central Government of India Department may usefully train the officers needed for our Provincial and Subordinate Services at Pusa.

(c) (i) Yes, but the services should be strengthened.

(ii) Further railway development in this Province is urgently needed.

(iii) The roads are bad and improvement is very necessary.

(iv) This is not important.

(v) & (vi) Satisfactory.

QUESTION 5.—FINANCE.—(a) Extension and strengthening of the co-operative credit movement. The staff of the department should be strengthened and as the officers have to do a lot of missionary work in the villages they should be adequately paid. For long-term credit, land mortgage banks should be started in every district and, in the initial stages, Government should grant loans to such banks on favourable terms for a long period to be repaid by easy instalments.

(b) At present only small sums are available for issue of *taccari* loans in ordinary years. It is true that when serious failures of crops occur, *taccari* loans are issued more liberally but the affected people regard such loans as gratuitous relief rather than as loans repayable and the result is that a considerable portion of the loans issued has to be written off, and such remissions have a demoralising effect. The co-operative credit movement has failed in localities where large sums of money were issued in *taccari* loans and remissions were large. As far as possible, *taccari* loans should be issued only through co-operative societies.

QUESTION 6.—AGRICULTURAL INDENTURES.—(a) (i) (1) For financing agricultural operations, purchase of plough-cattle, implements, etc.

(2) For marriages, funeral ceremonies, etc.

(3) Purchase and improvement of land and dwelling houses.

(4) Clearing family debts.

(5) Payment of land revenue or rent.

(ii) Village moneylenders, Marwari traders, co-operative societies.

(iii) (1) Unproductive use of loans in many cases.

(2) Multiplicity of creditors.

(3) Desire to defraud creditors.

(4) Repayment by instalments is not encouraged by village moneylenders.

(5) Indolence and passive resignation to fate.

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(b) Redemption of mortgages should be facilitated by the extension of co-operative mortgage credit which will permit repayment of loans from profits spread over a number of years.

(c) I am not in favour of such restriction.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) The evil of fragmentation is not, in my opinion, very serious yet in Assam. It is however necessary to begin consolidation now so that the process of sub-division, which will go on, may be countered to some extent. An arresting force will then continue to work.

(b) The customary law and usages with regard to inheritance and alienation. It is hardly possible to overcome these obstacles.

(c) I do not think that legislation can help much.

QUESTION 10.—FERTILISERS.—(a) Yes. Particularly the present waste of natural manures should be stopped. Storage of natural manure in covered pits has been demonstrated but more propaganda is necessary.

(c) By field demonstrations in places where a demand for fertilisers has grown up.

(d) Khasi Hills where bonemeal is now largely used for manuring terraced rice fields.

(e) Not in respect of ordinary village cultivation.

(f) Cowdung is rarely used as fuel in Assam.

QUESTION 11.—CROPS.—(a) (i) Existing crops can be improved by better tillage, manuring and use of better seeds. We are concentrating our efforts in popularising and supplying better seeds.

(ii) New crops such as potatoes, ground-nuts and pulses have already been successfully introduced in localities. In the Khasi Hills, potatoes are now extensively grown. In the plains also the cultivation of potato is fast extending. But for damages by wild pigs, the cultivation of ground-nuts would have extended much in the Surma Valley.

Fodder crops like *juar*, bloom-corn and Guinea grass have been grown on demonstration plots but the cultivators have not yet taken any interest in such crops.

(iii) Distribution of seeds should be made more and more through co-operative societies. A beginning has been made in Assam. We should also encourage as far as possible establishment of private seed farms.

(iv) This is a very difficult subject. In a Province like Assam, which is full of jungles and large uninhabited forest areas, the trouble is very great. The crop enemies are wild elephants, pigs, deer of all kinds, monkeys, porcupines and jackals besides birds of various kinds. Cultivators do not possess a sufficient number of guns. Even with guns it is difficult to stop depredations of animals like jackals. In numerous places, crops have to be watched both by day and night. Cultivators build raised huts over their fields whence they watch the crop at night by keeping up a noise.

(b) This is not important in Assam.

(c) Better seeds have improved crops like paddy, jute, potatoes and sugarcane. Manuring has improved the rice crop in the Khasi Hills.

QUESTION 14.—IMPLEMENTS.—(a) The question of improved implements suited to the economic condition of the people, the nature of the soil, the climatic conditions and the size and power of draught animals is one which requires careful study by a competent officer and until such a study is completed no definite conclusions can be arrived at.

(b) Improved implements and machinery like sugarcane-crushing mills and iron pans, for which there is already a demand, should be sold on the hire-purchase system to those who cannot afford to pay the price at once. This has already been recommended by our Development Board in its last meeting and we are working out definite proposals for submission to Government.

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(c) Manufacturers should know that conditions vary in different parts of India and the same standard implements will not do. They should send out representatives to study local conditions. Besides, implements should not be too costly and therefore beyond the means of our agriculturists. The manufacturers should also be prepared to sell implements on the hire-purchase system like Singer sewing machines.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) The local breed of draught bullocks and milch cows should be improved and for this purpose there should be a bull-breeding farm in every important district. There are also professional breeders, who are Nepalis. Such professional breeding should, if possible, be brought under control and improved by encouragement and assistance.

(ii) The milk-supply is almost entirely in the hands of Nepali graziers who keep their herds as near as possible to towns and supply milk, curd, *ghi* and cream to the townsmen. Pure milk is difficult to obtain as much adulteration is practised, particularly by retailers. In my opinion, Municipalities should establish their own dairies. The dairy industry with local cows cannot however be profitable as the milk yield is very poor. Cows of a better milking strain have to be imported.

(iii) The present practice of allowing dwarf immature bulls to roam at large has done much to degenerate the breed. This should be stopped if necessary by legislation compelling castration. The cultivators do not feed their cattle properly. The miserable cattle are allowed to roam at large in the winter after the rice crop is harvested and live upon whatever food they can manage to get. This not only deteriorates the cattle but makes the cultivation of dry weather crops without proper fencing impossible. The people should be compelled to collect and store the rice straw for their cattle and the impounding of stray cattle should be rigorously enforced.

(b) (i) Pastures are not only overstocked but in the dry weather they contain no fodder.

(ii) The cultivators will not enclose even standing winter crops like potatoes, sugarcane, mustard and pulse properly, not to speak of fodder grass for cattle.

(iii) Whatever dry fodder is available is not collected and stored. Two-thirds of the paddy straw is left standing on the fields to be trodden and eaten by stray cattle.

(iv) In the dry season green fodder on high lands is not available. In some places the people move their cattle to low-lying places called *sheels* for grazing. Fodder crops are not grown.

(v) The constituents have not been examined yet.

(c) December to March. Young cattle begin to thrive from May.

(d) (1) Collection and storage of hay.

(2) Cultivation of fodder crops.

(3) Ensilage in suitable places.

(e) There are really no large landowners in the Assam Valley—all are peasant proprietors. The landowners in the Surma Valley are most apathetic.

The Assam cattle are of a miserable breed. They are not at all properly looked after but still they breed fast. Frequently they are carried off by pestilence in large numbers. Bovine cattle cannot thrive in a wet and jungly place like Assam but buffaloes thrive well and the local wild buffalo is a splendid beast but the breed is fast disappearing as conditions favourable to it are also disappearing.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) This differs in different localities but the average for the whole Province, excluding hill districts, would be about 200 days. In some places some members of cultivating families come to towns and tea gardens for work as day labourers during intervals between planting and harvesting and again between harvesting and the time for cultivation which begins as soon as spring rains commence. Some follow subsidiary occupations such as lac-rearing, silk-rearing,

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mat, basket and *ghampi* making, etc., and some collect fire-wood, building materials and repairs their houses during the slack season while a considerable number sit idle and do practically nothing to augment their income. In the Assam Valley, the women help a good deal in agricultural work and during the slack season they are occupied with spinning and weaving. They are not idlers at all. Professional cottage industrialists like braziers, bell-metal workers, weavers, fishermen and potters are also agriculturists and they are fully employed in their own avocations during the agricultural slack season.

(b) Government are assisting the silk-rearing industry by supplying better and healthier seeds. The lac-rearing industry may be encouraged by abolition or reduction of the lac duty and by issue of brood-lac. Better marketing may be assisted by formation of co-operative sale societies. The Industries Department also assisted pisciculture by supply of carp-fry. We are also supplying orange seedlings and grafts and pine-apple suckers to the public.

(c) Really there are no obstacles except that the mill industry has to some extent restricted cottage industries in spinning, weaving and manufacture of metal wares.

(d) & (e) This will not provide employment. Already rice and oil mills and tea gardens exist in rural areas but the cultivators rarely work in them.

(f) Yes, not only for introduction of improved methods and appliances but also to arrange for better marketing of the products. The last-named subject should be studied by a man with considerable business experience.

(h) Intensive propaganda by the Public Health Department and the active interest of District Officers in rural reconstruction work.

QUESTION 18.—**AGRICULTURAL LABOUR.**—(a) (i) There is at present shortage of labour for tea cultivation. There is however a regular organisation to recruit labourers for tea gardens from other parts of India and legislation to check abuses, etc.

(ii) These areas in Assam are being fast taken up by settlers from East Bengal who are migrating permanently.

(b) For any large agricultural undertaking whether a tea garden or any other agricultural farm, agricultural labour is difficult to obtain. Neither the local people nor immigrants from Bengal will work on tea gardens or farms, though occasionally some do carry out piece work on contract. They do not like to identify themselves with imported indentured labourers from other Provinces. Besides, no one is laudless in Assam and agriculturists do not like to leave their land and work on estates as permanent labourers. The estates must therefore depend on imported labour.

(c) I do not think there is anything like surplus agricultural labour in Assam.

QUESTION 20.—**MARKETING.**—(a) With regard to all agricultural produce of this Province, there are only two markets, viz., the local market and the Calcutta market. By the term local market, I mean the local purchasing organisations like those of the Marwaris which are spread over the country in local bazars and marts, both large and small, and which are more or less accessible to agriculturists everywhere. Besides, agriculturists can sell their products at their very doors to small traders who visit the villages and make arrangements to carry the produce to the nearest mart. More roads and better roads will no doubt improve market facilities and reduce the cost of carriage, but on the whole I should think the existing local marketing facilities are satisfactory.

In the Calcutta market, there seems to be a good deal of speculation and consequent fluctuation of prices in jute, rice, cotton and mustard though fairly correct forecasts are published. In the case of tea, however, the producers are powerful enough to guard their interests and prices are regulated on the natural basis of demand and supply.

(b) The existing system is certainly not to the advantage of the agriculturists, but until the people advance in education and learn to combine and market their commodities better the existing system cannot be improved. My answer refers to produce grown by the mass of small cultivators such as paddy, jute, mustard, rape or other oil-seeds, cotton, potatoes, gur, fruits—specially oranges and *matilalai*.

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QUESTION 22.—CO-OPERATION.—(a) (i) As already stated, the Government staff for supervision in Assam should be strengthened and, wherever necessary, Government loans for long terms should be made available for facilitating co-operative mortgage credit operations. Besides, for better organising and running (in the initial stages) of co-operative non-credit societies such as sale societies and industrial societies, Government financial assistance should be given to enable the societies to employ competent managers with business experience.

(ii) We have already started a non-official agency in the Surma Valley known as the Surma Valley Co-operative Organisation Society the object of which is to encourage the growth of co-operative work in promoting rural sanitation and rural industries. It is to be regretted that enlightened non-officials are not coming in larger numbers to do rural reconstruction work in co-operation with the official staff.

(b) (i) The development has been almost entirely on the credit side of the movement. Out of nearly 1,000 societies now in this Province, 989 are credit societies. A large majority of the credit societies are solvent and are running satisfactorily though overdues, which come to about 17 per cent of total loans outstanding, may be considered as large. The badly run societies are almost without exception, those which are being managed by either incompetent or dishonest office-bearers. Closer Government supervision by an adequate staff is necessary.

(ii) We have no societies which may be properly called purchase societies. There are of course some consumers societies in urban areas which purchase goods for retail sale to members and these are known as co-operative stores. Our agricultural credit societies are allowed to purchase seeds, etc., from Government seed depôts for distribution to members. The value of seeds, implements or manures taken by each member is shown as a cash loan in the loan book and the purchases are financed by the Central Banks who pay directly to the seed depôt. These loans are made repayable at the end of the harvest and both the Central Banks and the societies charge a lower rate of interest for such short-term credit.

(iii)	}	None existing in this Province.
(iv)		
(v)		
(vi)		
(vii)		
(viii)	}	

(ix) A reference has already been made to the formation of a Co-operative Organisation Society in the Surma Valley.

(c) I do not think this would be proper or feasible.

(d) The credit societies have in the main achieved their object. At least, in areas served by the existing societies the prevailing rate of moneylenders' interest has been brought down considerably. These societies up till now however serve only a very small section of the rural population. At the end of last year the members of agricultural credit societies numbered 36,927 and they were indebted to their societies to the extent of Rs. 9,61,927. In other words, the loan per head of member stood at Rs. 26 only. As a matter of fact, however, in Assam a considerable number of members join societies merely for the sake of co-operation and not to borrow. Really about half of the members are actual borrowers and so the loan per head of borrowing members will come to about Rs. 50.

The moneylenders' rate of interest on unsecured loans may be put down at 36 per cent per annum on an average but the co-operative societies charge interest at an average rate of 15½ per cent. Thus, during the last year alone, the borrowing members were saved from moneylenders' interest to the extent of nearly two lakhs of rupees. Besides, the agricultural societies held at the end of the year a sum of Rs. 1,42,280 as deposits of members and a further sum of Rs. 55,635 as share capital paid up by members. The two sums together represent the members' savings invested in their societies.

QUESTION 23.—GENERAL EDUCATION.—(a) Sons of actual agriculturists rarely proceed above the middle school. Even in elementary and middle schools, the education they get instead of giving them an agricultural bent

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has the contrary influence with the result that the boys after leaving school either give up actual cultivation work or become agriculturists of an indifferent type.

(b) (i) I am not in a position to suggest definite methods, but the present system certainly requires a thorough change which may however be too costly for the Government to undertake.

(ii) Compulsory primary education is going to be tried in Assam shortly. I have no experience.

(iii) I am not aware of the exact position in Assam.

QUESTION 24.—ATTRACTING CAPITAL.—(a) Men with large capital and enterprise are very few in Assam, but Indians of other Provinces having command of capital may come and start agricultural undertakings if waste lands are settled with them. At present in settling waste lands for ordinary cultivation, the small cultivator who actually tills the soil is preferred.

(b) There are no large owners of lands in Assam except in the districts of Goalpara and Sylhet which are permanently settled. These owners are not sufficiently enlightened to undertake works of land improvement.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) As already stated by me rural reconstruction work, under present circumstances, cannot be left entirely to patriotic non-officials. Their number is very few and they do not get sufficient support and encouragement from either the wealthier classes or the politicians. The Government should take up this work and the District Officers should identify themselves with this work far more closely. The Assam Rural Self-Government Bill has been recently passed in the local Council. This legislation provides for appointment of village authorities the main functions of which will be to improve village sanitation and medical relief. Under this legislation, the Local Government may appoint a Registrar of Village Authorities to control the working of these bodies but unless District Officers wholeheartedly supervise and take an active interest I am not sanguine of success. Abuses are possible and unless these are checked, the enthusiasm of the rustics will never be roused. In the old days there was much co-operation in the villages and people combined to undertake works of public utility. At present, however, there is much of dissension and friction in the villages.

(b) Such enquiries will be largely suspected and I do not think that very reliable information will be collected.

(c) No.

QUESTION 26.—STATISTICS.—(a) (i) We get quite accurate figures for the six temporarily settled plains districts which possess a fully organised land record staff. For the two permanently settled plains districts and the hill districts, only conjectural figures are available. Reliable figures for these places cannot be had unless extra staff be entertained.

(ii) This is arrived at as a result of experimental harvestings made by officers of the district staff and the staff under the Director of Agriculture. District Officers and the Deputy Director of Agriculture report estimated outturns to the Director of Agriculture who finally puts down the percentage. The estimates are, I believe, fairly accurate.

(iii) Enumeration of livestock is carried out by the land records staff in the temporarily settled districts and by *chowkidari* panchayats in the permanently settled districts. The existing method seems satisfactory.

(iv) This is done to some extent when a district is under resettlement. Ordinarily the Agricultural Department does not concern itself with such information.

(v) Agricultural statistics are collected and arranged by the Agricultural Department. They are forwarded to the Local Government and the Director-General of Commercial Intelligence and Statistics. Forecasts are published in the local gazette by the Director of Agriculture. Jute forecasts are forwarded to the Director of Agriculture, Bengal, who publishes in Calcutta a consolidated forecast for the three Provinces of Bengal, Bihar and Orissa and Assam. The existing method seems to be satisfactory.

(b) The collection and publication of inter-provincial trade statistics should be revived and to assist the Director, in this branch of work, a qualified statistical and commercial intelligence officer should be entertained on adequate pay.

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Oral Evidence.

24657. *The Chairman:* Rai Bahadur Barua, you are Director of Agriculture, Director of Industries and Registrar of the Co-operative Societies of the Province of Assam?—Yes.

24658. You have provided the Royal Commission with a note of the evidence that you wish to give. Do you desire to make any statement at this stage, or shall I proceed to ask you some questions?—It will be better if you ask questions.

24659. Would you give the Commission very shortly an account of your own training in any past posts that you may have held?—Before taking up the Department of Agriculture, I was Registrar of Co-operative Societies and Director of Industries. My substantive appointment is that of Deputy Commissioner in the Assam Commission and my present post is a superior I.C.S. post in Assam.

24660. How about your technical training?—Technical training with regard to agriculture I have none. When the Industrial Commission came here I was placed on special duty in connection with that Commission and that was why, I think, I was selected to hold the appointment of Director of Industries. Previous to that I was on district work and did only executive work.

24661. Have you had an opportunity of reading the note which has been provided for the Commission by the Surma Valley Co-operative Society?—No.

24662. Are you familiar with the working of that society?—Yes. The Surma Valley Co-operative Organisation Society was started only last year and I think they have begun work only this year.

24663. I propose to refer to one or two points raised in that memorandum. If, of course, you are not sufficiently familiar with any of the points to wish to answer, please let us know?—Unfortunately they have not sent me a copy of that memorandum.

24664. I shall remember that and make the point plain to you. Would you let us know how the officers of the Agricultural Department are distributed throughout the Province? In the first place, at the headquarters there is the Director of Agriculture that is you yourself; what other officers have you at the headquarters?—None. At present there is only one Deputy Director for the whole Province, although the sanctioned scale consists of three Deputy Directors. The two other posts have been held in abeyance as a measure of retrenchment. The Deputy Director is posted at Jorhat where there is an agricultural laboratory and also a farm. The Economic Botanist is also stationed at Jorhat and at the headquarters here in Shillong there is none besides myself.

24665. Then as regards the subordinate officers of the service, how are they distributed in the Province?—We have three Superintendents of Agriculture and the Province is divided into three charges. There is one Superintendent for the whole of the Surma Valley; there is one for the Upper Assam Valley districts; and there is one for the Lower Assam Valley districts. One is stationed at Sylhet, another at Gauhati and the third at Jorhat. These are the three Superintendents. Then we have got Agricultural Inspectors; we have one Agricultural Inspector in each sub-division in the Surma Valley, and in the Assam Valley one in each district.

24666. They are subordinate to the Superintendents?—Yes.

24667. What is the training of the Inspectors?—The Inspectors are all graduates either of Sabour Agricultural College or of the Nagpur Agricultural College.

24668. Is the promotion made from the Inspectorate to the Superintendent's grade?—Yes. At present we have got two Superintendents who were originally Inspectors and have been promoted to the Superintendent's grade.

24669. Have you a grade which is subordinate to the Inspector's grade?—Yes, they are called demonstrators.

24670. Where are they trained?—They are trained on our farms.

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24671. On the central farm?—They are trained on different farms. We have got four farms; we train them there and then appoint them as demonstrators.

24672. Are you satisfied with their capacity?—I am not satisfied with their capacity. I think the training they get is not enough but to get a better class of men we have to pay higher.

24673. Is it a question of getting a better type of men or of improving the training?—The class of men that we recruit have not got sufficient training and I think a higher type of men would be better.

24674. Would you tell the Commission how many of these demonstrators you have in the Service?—We have got 52 demonstrators.

24675. How are they distributed?—Their distribution is given in the memorandum.

24676. I do not recall that it was made quite clear there. Could you point to the reference?—There are altogether 53 agricultural demonstrators of whom 22 are in the Suima Valley, 25 in the Assam Valley and 9 in the hill districts.

24677. Is the staff which you describe adequate for the tasks and duties with which your department is charged?—No; I think we want more Inspectors. I am speaking of the subordinate establishment, not only Demonstrators but also Inspectors. We have been increasing the staff almost every year and what is again necessary is to strengthen the superior staff. At least we want one more Deputy Director because one Deputy Director cannot manage the whole thing at all. That is in regard to the executive staff. With regard to the scientific staff also, I have already given my opinion in my answers to the Questionnaire.

24678. Yes; you point out that "the only superior officer in the scientific staff is the Botanist"?—Yes. We had a Chemist, but he retired and after him nobody has been appointed in his place.

24679. Would you let the Commission know whether in your view your arrangements for recording experience, the result of various experiments which you are making and the result of your policy in the matter of demonstration, are satisfactory? Do you think that records of these matters have been kept?—Yes; records of scientific investigations have been kept no doubt.

24680. But are the results of experiments or demonstrations being preserved?—We are experimenting in our farms and that is recorded as scientific investigation; only the results of experiments have been recorded and no record is kept particularly with regard to demonstrations.

24681. You realise how soon these matters are forgotten and you realise also, I am sure, how valuable the accounts of failures as well as the accounts of successes will be in the future?—Yes; as a matter of fact, we used to publish the results of demonstration also every year; but, as a matter of economy, those reports have been abolished.

24682. As a measure of economy?—We used to publish reports with regard to experimental stations and demonstrations.

24683. That has been discontinued?—Yes.

24684. And that as a measure of economy?—Yes.

24685. But the fact that you do not publish them does not prevent you from recording, does it?—No; as a matter of fact, a summary of all our demonstrations as well as scientific investigations is given in our annual reports.

24686. Have you anything which you wish to say about Pusa, and the services rendered by Pusa to your department in this Province?—Yes; we had here lately the assistance of the Mycologist in the matter of potato disease and we had also the assistance of the Imperial Agriculturist in drawing up a scheme for the cattle farm that we are going to open at Khanapara. He visited the Province twice last year in connection with that. As a matter of fact, the site was selected by him and the policy also was laid down by him.

24687. Are you satisfied with the services rendered by Pusa?—So far I think we are satisfied. But my opinion is that our officers might get

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more training at Pusa. We cannot send all our officers at once; but if we send them one by one every year for training that will be a good thing.

24688. Have you put up proposals to Pusa?—No; I have not yet put up proposals because the training they are now giving is post-graduate training which is only for Provincial Service officers. I mean these Agricultural Superintendents can get it, but I should also have the subordinate officers trained there if possible, as also our scientific assistants. We have some assistants and they also need further training in particular branches of work, either in mycology or entomology.

24689. What I want to know is whether you have made any proposals?—No; I have not made any proposals.

24690. You would expect to make proposals yourself, and you would not expect to receive invitations in these matters, would you?—The policy with regard to training has been laid down and the training is given only to distinguished graduates in science and also to officers of the Provincial Agricultural Service.

24691. I understand that having no training facilities here, you are sending certain officers or certain persons who are to be officers of the Service to Agricultural Colleges in other Provinces?—Yes.

24692. How is that working?—We send them according to our requirements, that is, when we want to appoint them. If we want any Agricultural Inspectors then we send some students there at Government expense.

24693. *Prof. Gangulce*: Where do you send them?—We are now sending them to Nagpur.

24694. How many have you sent already?—There are three now undergoing training at Nagpur and one at Bangalore in regard to dairying.

24695. *The Chairman*: Are you in touch with neighbouring Provinces in the matter of research?—We are not actually in touch in regard to research but we are getting help sometimes.

24696. In what way?—From Bengal we used to get stud bulls from their farm at Rangpur. Sometimes we get their seeds; for example, the Dacca paddy seeds. They also take our seeds sometimes.

24697. *Rai Bahadur R. M. Das*: Also sugarcane sets?—Yes.

24698. *The Chairman*: In dealing with pests do you keep in close touch with the neighbouring Provinces?—Yes; we are to inform them by wire as soon as any pest is attacking any district adjoining the Province of Bengal and they also inform us similarly when there is any pest in any of the districts adjoining the Province of Assam. Also the water-hyacinth problem is being worked out in consultation with Bengal.

24699. Have you got a combined policy for dealing with water-hyacinth?—No; my department is not dealing with water-hyacinth at all; it is being dealt with by the Local Boards or the District Boards.

24700. Do you think that is a good scheme, or do you think that you yourselves might take it in hand?—I think there ought to be an officer in the department to deal with water-hyacinth.

24701. *Prof. Gangulce*: It is dealt with by the Local Boards and not by the Public Works Department?—No, not by the Public Works Department; but by the Local Boards.

24702. *The Chairman*: Are you aware whether any attempt has been made to co-ordinate the efforts of the various Local Boards?—In this matter it is the Local Boards of the Surma Valley that are concerned; it is there that the pest exists; it does not exist in this part of the Province and I do not think there is any co-ordination between the different boards, but I am not quite sure about it.

24703. Your responsibility extends over the whole Province, does it not?—Yes.

24704. Have you ever thought out at all the possibility of a central body with its institutions at Pusa and elsewhere taking a larger part in solving the various problems of all the Provinces and being in a position to assure co-ordination and inter-communication between the

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Provinces? Have you thought out that problem at all?—I have not thought about it; but the thing is the different Provinces have got different problems and for that reason the Provinces have to find their own scientific departments more or less complete. Of course, the Government of India or Pusa authorities might depute some of their officers to study the different conditions in the different Provinces, when asked for.

24705. There are certain problems of general application, and of a fundamental nature, which might well be attacked by a central institution?—Probably these questions will better be studied and better handled in a central institution.

24706. Have you in mind any scheme to extend or rather to create facilities for agricultural education in the Province?—I have suggested it in my answers. I think that we should have some sort of agricultural education in our middle schools, if not in all the middle schools at least in selected middle schools, one in each district. Of course I have got no experience in this matter but that is my impression. At present we are doing absolutely nothing with regard to agricultural education.

24707. It is a very difficult problem in these areas where population is so sparse, is it not?—Yes.

24708. On the question of demonstration and propaganda, are you finding that demonstration in the cultivators' own fields is the most effective?—I should think it is effective. But what the cultivators want is a very striking improvement. Unless the improvement is very striking they are not impressed.

24709. You mean 4 or 5 per cent is not good enough; they want 20 per cent?—Yes; they want a very heavy yield and that too without changing their own methods if possible.

24710. Then under the heading "Administration," Question 4, you say, "Further railway development in this Province is urgently needed." Have you ever represented the need for that development to the Government here or to the Railways?—Of course at every opportunity I brought to the notice of the Government not only the necessity of railway extension but also the necessity for other facilities.

24711. Have you any definite schemes in hand which the railway companies might put into effect?—I think, for instance, that the transport of fruits and vegetables, such as potatoes, from Assam is very defective; the system ought to be improved; they ought to provide proper wagons.

24712. But on this question of development you are thinking, I take it, of the possibility of further branch and feeder lines being built?—Yes.

24713. Have you any definite schemes in mind?—Practically in all districts railway development is needed, but it is gradually coming; during the last few years we have seen very good development, and if that goes on, I think in a few years the extension of railways will be very satisfactory in Assam.

24714. Do you think the railway authorities have been remiss in the matter of providing further railway facilities, or are you satisfied with what is being done?—I am satisfied with the rate of progress in this matter, at least.

24715. Are your principal roads good?—No, they are all Lutchas; except for very short lengths they are all unmetalled. We have got two principal trunk roads and both of them are unmetalled and not fit for mechanical transport.

24716. Are the roads you are thinking of to some extent under the Provincial Government?—All the trunk roads are under the Provincial Government and most of the feeder roads are in charge of the Local Boards.

24717. Are the roads under the Local Boards better or worse than they used to be?—The roads under the Local Boards are certainly worse than those maintained by the Public Works Department; they have not got the money to improve those roads.

24718. Are the roads under the local authorities getting worse, or have they always been as bad as they now are?—I think they are as bad as ever; they have not been improved at all.

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24719. In the note by the Secretary of the Surma Valley Co-operative Society, it is suggested that when new roads are made instead of making burrow pits on both sides of the roads, the material for the road might be taken from one side only, so that a continuous canal might be cut alongside the road, with a view to improving the drainage of the district and also with a view to providing water transport during those months of the year when the roads are impassable. Have you large areas in the Province where the land is sufficiently flat to make a scheme of that sort practicable?—All the plain districts are entirely flat, but then this water communication along the roadside is needed only in the Surma Valley. This does not really apply to Assam at all, because however deep the canals might be they would all be dried up in the winter; it is high land; but this question as to whether you might have a canal alongside the road is a question on which I think, to be decided by the engineers; I do not know.

24720. But it bears very closely on agricultural development and I wanted to know whether you had any views to express?—It may be dangerous to have a canal so near the road; the road may be damaged.

24721. *Rai Bahadur R. M. Das*: In one district in Bengal the District Board makes roads with such canals alongside them which are used for ferry traffic by boat; the roads have not been damaged by the canals?—Probably the better way would be to have a cut-track on one side of the road so that the road may not be damaged by heavy bullock-cart traffic.

24722. *The Chairman*: During the dry months?—Yes.

24723. And then you allow the bullock traffic to go on the surface of the road during the wetter months of the year; is that your idea?—In the Assam Valley even in the rainy season the track will be useful.

24724. Who is going to use the road?—The road may be used by pedestrians, mechanical transport, motor cars, and so on. Bullock-carts do a lot of damage to *kutcha* roads; the annual expenditure in repairs is very great on account of that.

24725. Would it not be rather a drastic step to prevent the cultivators from using the roads with their bullock-carts when the cultivators largely pay the taxes from which the roads are maintained?—The side track will also be maintained. As a matter of fact, that system has been adopted in one district, and there has been no complaint.

24726. Have you ever heard of a corduroy road?—No.

24727. That is a road made of logs laid side by side cross-ways over the road; has that ever been tried here in the wetter districts, do you know?—It has not been tried; it would be very costly, I think.

24728. It depends on how near the timber is?—Yes.

24729. You have told us that you are in charge of the co-operative movement?—Yes.

24730. Have you any special staff to assist you in that work?—Yes, I have got now one Assistant Registrar and nine Inspectors.

24731. Do you yourself find time to examine each proposed society that comes up for registration?—Beforehand, of course, I have not the chance of seeing whether they are properly organised. The registration papers generally come through the Inspector and the District Officers to me; but I, of course, annually inspect a certain number of societies.

24732. In answer to our Question 5 on Finance, you say, "The co-operative credit movement has failed in localities where large sums of money were issued in *taccari* loans and remissions were large." Would you describe exactly what happened?—In that district there was failure of crops for two years; in the second year of the failure Government had to issue a very large amount of loans, about 18 to 20 lakhs of rupees; they issued these loans to all needy people. The result was that, I think, about a quarter of that amount had to be remitted as irrecoverable; about 5 or 6 lakhs had to be remitted by the Government.

24733. Was that owing to an extensive crop failure?—The loans were given to persons who had no property and from whom no recovery was possible.

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21731 Were these loans given within a very short period of time?—Yes.

21735. What were the special circumstances which caused these loans to be given?—They were given on account of failure of crop; at the same time our societies also were given Government loans, and with that money they issued loans to their members in the same locality. The societies realised everything, but Government had to remit. The people came to realise that if there had been no society there probably they would have got loans from Government on easier terms and most of that would have been remitted.

21736. What happened to the loans that the co-operative societies had already advanced?—They realised everything and they repaid the Government loan in full.

21737. What happened to the existing co-operative loans?—The co-operative loans were realised from the members; of course extensions had to be given, but they were realised.

21738. Did the societies collapse?—They collapsed afterwards because the members did not like to maintain the societies afterwards. Some of them collapsed; some of them are still existing.

21739. In the note by the co-operative society, it is suggested that in some cases where payment of interest and repayment of capital on loans advanced by the co-operative societies on a short-term basis are overdue, the fact really is that the loan has been taken for what may properly be called long-term purposes?—Yes.

21740. Do you agree with that?—The distinction is not sometimes properly made by the societies themselves, but really short-term credit is never overdue; for instance, the loans given for purchase of seeds.

21741. Then under the heading Agricultural Indebtedness, have you any statistics that you could lay before the Commission showing the districts in which agricultural indebtedness is most heavy?—I am not prepared with statistics, but in the preliminary memorandum I have given an estimate of the total indebtedness of the whole Province.

21742. Yes, I saw that, and I wondered whether you could amplify that at all; is the extent of the debt in these districts known accurately?—It is not known accurately.

21743. There has not been anything in the nature of a survey?—No.

21744. It has been suggested in the note that I have referred to that one of the main causes of indebtedness is the small size of the holdings in the districts that you refer to?—I am not sure about it; I do not think that it is entirely due to that.

21745. You do not think you have yet come to the stage where the smallness of the holding renders the cultivator's labour uneconomic in the sense that he cannot finance himself and his family?—To some extent that is so in some places, but as I say in my answer, the evil is not very great here in Assam.

21746. How about the problem of indebtedness in the hill country?—In the hill country there are no statistics available at all. Nothing is known.

21747. What is your impression?—I think that, compared with the people in the plains, the hill people are not very heavily indebted.

21748. They do, I take it, finance themselves through the money-lender?—Yes, they do. In the Khasi Hills, for instance, they are financed by the Marwaris.

21749. Are you familiar with the Provincial or All-India statutes dealing with debt?—There are certain enactments of course with regard to debt.

21750. Are you thinking of any in particular?—They are not in force in Assam always. For instance, the Usurious Loans Act is not in force.

21751. You do not hear of them being put into force in this Province?—No, they have not been in force.

21752. Mr. Calvert: It is in force, but not enforced?—No, not enforced.

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24753. *The Chairman* : Then about land alienation also, there are certain enactments in other Provinces?—There is none in this Province.

24754. Have you any exact particulars about the size of holdings other than those which have been provided?—No, that is what has already been provided in the memorandum by the Director of Land Records. Beyond that there has not been any sort of enquiry with regard to the size of holdings.

24755. Under the question, Fertilisers, you say that in the Khasi Hills bonemeal is now largely used for manuring terraced rice fields. Where is that bonemeal purchased?—From Calcutta; we purchase only sterilised bonemeal from Calcutta.

24756. What price do you pay per ton?—That differs in different places in different years. I think I could give you last year's figures; I think it came to something like Rs. 3 per maund.

Hai Bahadur R. M. Das : No, up to the foot of the hills it comes to about Rs. 8.

24757. *The Chairman* : Is there any considerable export of bones from the Province?—Yes, there is. We had a bone-crushing factory here in the department but that was not successful and so we gave it up.

24758. Is there any concern, or has there been any concern manufacturing bonemeal in the Province?—No, none yet.

24759. Would you give us in detail your arrangements for the distribution of seed?—We have got three seed depôts, one at Gauhati, another at Jorhat, and the other at Sylhet. In a particular seed season, for instance, the potato season, we have branch depôts, temporary depôts in different centres fed by these main depôts and from those depôts we sell to the public, the agriculturists, lately we have been issuing through the co-operative societies largely.

24760. Are you getting any seeds of improved varieties from Bengal or other Provinces?—From Bengal we have been getting paddy and jute, both *Chinsura green* as well as *Lakha bombai*.

24761. Have you got the strain from there or the actual seed that you have distributed?—As regards jute seeds the best supply is available in this Province itself. The Bengal Government take all their supplies from Messrs. Birkmyre Brothers here in Assam who grow an improved variety of jute; we are also getting it from that source to some extent.

24762. How about rice seeds?—We get rice seeds from Bengal but we are growing them ourselves. We are getting seeds from our own farms and also from selected cultivators for distribution.

24763. Of this amount of 1.150 maunds of improved paddy seeds that you distribute, what percentage is grown in your own seed farms and what percentage do you buy?—Practically the whole of that is obtained from our own Province.

24764. The whole of that is produced from your own farms?—Yes.

24765. I notice that your note does not touch the question of Irrigation at all?—No; there was very little time and besides irrigation is not very important here.

24766. Is it not a problem in any district in the Province?—It is a problem in the winter, particularly in the Surma Valley where the water dries up; there is difficulty with regard to the particular kind of paddy known as *boro* grown in the winter.

24767. Do you think there is an opening for large irrigation schemes by canal or are you thinking rather of smaller schemes?—I am thinking of irrigation by means of pumps.

24768. From deep wells?—No, there is the fishery water, the *bhil* as it is known here and the surrounding area is cultivated with paddy. The only question is to get the water from the *bhil* on to the terraces above.

24769. That is ordinary lift irrigation from the *bhils* in the dry season. Do these *bhils* retain sufficient water?—Yes.

24770. Have you districts where bunding would be required?—There are bunds already provided by the Public Works Department in some districts to prevent floods.

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24771. Is that a problem to which you have given close attention?—Yes, these *bunds* are, wherever necessary, properly maintained by the Public Works Department but some more *bunds* are necessary in places. In the olden days of the Ahom Kings they had a very good system of *bunding*; the Public Works Department have maintained only some of them and some of them are now in disuse.

24772. Is there any officer available in the Province to give advice to cultivators as to the carrying out of minor irrigation schemes?—There is none.

24773. Now about the question of Soils, have you had anything in the nature of a soil survey of the whole or any part of the Province?—When we had a Chemist he did some survey work in the Sibsagar district; since he left nothing has been done.

24774. Have you got the records of those surveys?—Yes.

24775. Have you used them at all?—These records were mostly with regard to liming of soils, but liming is not done by the ordinary cultivator. It is done by the tea-planters, but the ordinary cultivator never goes in for liming.

24776. *Prof. Gangulee*: Do you think there are any differences in the acidity of the soil?—Yes.

24777. *The Chairman*: And you have got the data for that?—Yes.

24778. In what district was the survey carried out?—In the Sibsagar district.

24779. What do you think is the most important deficiency in the soils of your Province?—I could not tell you exactly, but I think excessive acidity to some extent.

24780. Lime is deficient over an important area, is it not?—Yes.

24781. Is lime available?—Yes.

24782. Have any experiments been carried out designed to discover the effect of providing lime by artificial means?—The liming was done by means of crushed limestone but that has now gone into disuse even in the tea gardens.

24783. Have you tried the effect of lime in any Government farm?—Yes. It was tried on the Jorhat farm.

24784. With what results?—With satisfactory results. At the Jorhat farm, I should be able to give you the records of the liming experiments carried out.

24785. Now we come to the question of Veterinary. You say nothing about that in your note of evidence. Do you wish to make any remarks on it now?—I have not made any attempt to answer that question because Veterinary is not under me; it is administered by a different department.

24786. Do you agree with that division of responsibility, or rather do you approve of that division of responsibility?—I think I do.

24787. You do not want the Veterinary Service to be under yourself?—No.

24788. Are you in touch with the heads of the Veterinary Service?—Yes.

24789. Now then with regard to the question on Animal Husbandry. The Commission have had the advantage of looking over the Upper Shillong farm yesterday. Is that the only farm where cattle are bred?—That is at present the only farm.

24790. There was this other farm that you mentioned at Khanapara?—Yes, it is under construction.

24791. What is to be your policy at Khanapara?—At Khanapara we are going in only for draught animals and not for milk, purely draught.

24792. Whose advice have you sought?—We sought the advice of Mr. Henderson, the Imperial Agriculturist.

24793. Are you not going in for the dual purpose animal?—No.

24794. Then with regard to the farm that we saw at Upper Shillong yesterday what is your policy there?—The policy there is to have a breed of

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cattle of a better milking strain than what we can get locally. That is the policy for the hill districts where that kind of cattle is known to thrive; they are no good for the plains; we have tried them there.

24795. How long has that herd of cattle been in existence?—Since the year 1896. I think.

24796. In continuous existence?—Yes. They have tried all manner of experiments with all kinds of cattle, namely, the Bhutia, Khasi and Manipuri species. No regular, definite policy has been followed from the beginning.

24797. How far do your milk records go back?—Our milk records have been kept since 1921, that is, since the farm was placed under a Deputy Director.

24798. Before that no record was kept?—Before that there was only the Farm Manager, and there was no one really efficient and capable of looking after these things.

24799. Do you know the milk records of the dams of the bulls at present in use in any of the farms?—We do not.

24800. Would you agree that a knowledge of the milk records of the strains from which your bulls are chosen is a very important point?—It is very important indeed. It is the bull which gives the milking quality to the offspring.

24801. In answer to our question as to when the shortage of fodder begins to tell on your cattle and when they begin to recover you say, "December to March. Young cattle begin to thrive from May." How acute is your shortage in this Province?—It is very acute.

24802. Not in the hills, I take it?—Not so much in the hills as in the plains.

24803. I noticed coming through the countryside that in some areas the cultivators were engaged in drying rice straw and then stacking it. Would that be for fodder?—Yes; it makes very good fodder.

24804. Why is that practice not more general?—The hay that is collected is perhaps meant entirely for the imported cattle which are more valuable.

24805. Imported working bullocks; is that it?—Yes, imported cart-bullocks.

24806. Are very few cart-bullocks bred in this Province?—Every cart-bullock has to be imported from Bihar from the various fairs there. As the cultivators pay a high price for them, they look after them and take proper care of them; the local cattle are not cared for at all.

24807. What attempts are you making to demonstrate the use of silage?—In the plains we have been making experiments in aboveground silos, but we have ourselves not been successful yet. Pit silos are not considered to be useful in the plains.

24808. Because of the wet?—Because of the heavy rainfall.

24809. Have you tried making a mound and making a pit silo in the mound?—Not that; we are trying bamboo silos.

24810. Are you familiar with the experiments at present being made in Bengal?—No. I do not know what experiments they are making.

24811. Would you know about those experiments if any were being made?—If they are making successful experiments, I should like to send one of my officials to see them.

24812. Have you attempted to find out what other experiments are being made in other parts of India?—I have myself seen silos in other parts of India, in Pusa and other places. But the conditions there are different; they have a small rainfall in those Provinces.

24813. Are there many sheep in the Province?—No; very few. They are all in the hills, not in the plains.

24814. How do they stand the rains?—They do not thrive in the hills. The sheep that are there have been acclimatised, but there is very little wool on them.

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24815. What grasses grow on these open down lands?—We call that thatch grass.

24816. Is that a fodder grass?—That is a fodder grass when very young, but when it is mature it is not eaten by the cattle at all.

24817. Is the goat an important animal in the agricultural economy of the Province?—No. It is like our cattle; we get a miserable type of goat in Assam.

24818. Would you turn to your answer to Question 17 on page 5? I understand that you are in charge of the sericultural industry; is that so?—Yes.

24819. Is that an important industry in the Province?—It is a very important industry.

24820. What special officers have you to assist you in that work?—I have a Superintendent and also an Assistant Superintendent of Sericulture. We have got two sericultural stations with their staff of rearers, overseers and all that.

24821. Are there many co-operative societies for silk-rearing?—No.

24822. Is that a whole-time occupation or a part-time occupation?—It is a part-time occupation.

24823. Have you no whole-time sericulturists?—There is a caste called *Katonis*. But the men belonging to that caste also do cultivation because silk-rearing is only done in certain months of the year, about seven or eight months; in the winter there is no silk-rearing.

24824. Do the sericulturists do their own reeling?—Most of them do their own reeling.

24825. Have you a weaving caste here?—There is a weaving caste in the Surma Valley; but, in the Assam Valley, there is no caste restriction; everybody weaves.

24826. Is most of the silk grown in the Province woven in the Province?—Yes.

24827. Is there an important export trade?—There is an important export trade in woven Assam silk goods, and also in *muga* reeled silk which is taken for making embroideries in Bengal and also for fishing lines.

24828. Silk thread for fishing lines?—Yes.

24829. That is twisted in the Province?—That is reeled in the Province. We grow three varieties, the mulberry, the *muga* and the *eri*.

24830. *Prof. Gangulee*: Which is more favourable for silk-rearing, Assam Valley or Surma Valley?—Assam Valley.

24831. *The Chairman*: Have you available the average net profit per acre under mulberry?—Small areas are cultivated by these people in their homestead land.

24832. Do you know how much net profit accrues to the cultivator from an acre of mulberry?—Sometimes they get the leaves from other places also, so that the acreage profit is difficult to calculate. A man may not have any mulberry tree in his land; he may be getting it from jungles and other places; he may be rearing silk without any mulberry cultivation.

24833. Have you ever had a chance to study the hydro-electric survey of the Province, if there has been one?—There has been a hydro-electric survey.

24834. By the Government of India?—By the Assam Government.

24835. When?—That was three or four years ago. Mr. Blenkinsop, one of the Executive Engineers, was put in charge of it and he has submitted a report.

24836. Is it complete?—Yes.

24837. Have you seen it?—Yes.

24838. What conclusion did you draw from reading the report?—There are great possibilities of developing hydro-electric power in Assam. For instance, the Burnihat scheme to harness the river which you crossed the day before yesterday nineteen miles from Gauhati, will develop electricity to run an electric train from Gauhati to Shillong.

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24839. Is there a stream of water running all through the year near this town?—Yes.

24840. Is it used for developing hydro-electric power?—Yes, it is used for electric lighting. They have taken only a small amount of power. If there had been industrial requirements they could have developed much more power.

24841. *Sir Henry Lawrence*: Where is that place?—It is only a mile from Shillong.

24842. *The Chairman*: You say nothing in answer to our questions about Forests. I should like to ask you whether there has been sufficiently close touch between yourself as Director of Agriculture and the officer in charge of the Forest Department in the Province?—I am afraid I am not in close touch. As a matter of fact, there are certain subsidiary industries which really ought to have been fostered by the Forest Department but which are not receiving their attention, for instance, lac-rearing.

24843. Does not that come under the head of Industries?—Yes; it comes under Agricultural Industries.

24844. You are not responsible for that?—No; I am not. I am not because I have not any staff to do lac culture. I should think the Forest Department is pre-eminently fitted to look after that.

24845. Have you ever asked them what they think about it?—There was a proposal that they should do it, but it was ultimately decided that they have not got to do it. At present nobody is doing anything with regard to lac.

24846. Is there a large quantity of fodder grass in the forests in this Province?—The forests are generally very far away from the village sites, so that the forest areas are really of no use to the cultivators; but they are of use to the professional graziers who roam about the country with their herds, and from them of course the Forest Department realise a grazing tax.

24847. Is it from the professional graziers that the cultivators in the plains buy their working cattle?—Yes, their plough bullocks.

24848. Are there any forests reasonably near the plains area where reserves of fodder could be accumulated against the season of shortage?—Reserve forests are far away from the village sites.

24849. How about the provision of fuel for the population in the plains?—They can get it from the village forests, and also by paying a small fee from the Unclassed State forests. Reserved forests are far away.

24850. Are there ample supplies of fuel in the plains?—I think there is not only ample fuel, but also building material.

24851. There is no shortage?—There is shortage in the Surma Valley where the country is mostly open and there are no forests.

24852. That is owing to the difficulty of expensive transport?—Yes.

24853. Do you happen to know whether the Forest Department is doing anything to meet the requirements, in the matter of fuel, of the population in that area?—I do not think they are doing anything.

24854. Do you think the absence of that fuel leads to the burning of cowdung?—Cowdung is very rarely burnt here in Assam.

24855. Where no fuel is available what is burnt?—They burn jute stalks or other materials, such as bamboos, which they grow themselves. Cowdung is very rarely used as fuel. For boiling and preparing par-boiled rice they make use of cowdung.

24856. Has there been any survey of the organisation of marketing in the Province?—No, there has not been any survey.

24857. Do you think that a survey would be useful?—The main channels of marketing are well known, but I think a survey would be useful; particularly before we start co-operative marketing we ought to have a survey.

24858. On the question of co-operation, how do you suggest that the case for long-term credit should be met?—The only way, as far as I can see, is to have mortgage credit organised.

24859. By land mortgage banks?—Yes.

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24860. In the meantime, there is nothing of that sort?—At present, of course, mortgage credit is being given by the ordinary moneylenders at high rates of interest.

24861. Because there is nothing in the nature of land mortgage banks?—We have just started one; one is now in operation.

24862. Actually in operation?—Yes, actually in operation.

24863. How is the capital provided?—At present their capital is provided from shares and deposits.

24864. Any debentures?—They have not issued debentures yet, although there is provision for it in the by-laws, and no Government loan has yet been given to them.

24865. In what area is the bank in operation?—In the Kamrup district, at Gauhati.

24866. How long has it been working?—For a year.

24867. It is a little early to say whether it has proved a success or not?—Yes. Their share capital is now Rs. 50,000.

24868. In answer to Question 23, you say on page 8, "Compulsory primary education is going to be tried in Assam shortly." In what districts is it going to be tried?—I think it is going to be tried all over the Province, the Act has been passed in the last Council, and I expect something will be done.

24869. Will the local authorities have the option of undertaking schemes of compulsory education under the Act?—Yes.

24870. Have the local authorities the option to start schemes of compulsory education now?—No; the Act gives them the power to do that, and also to levy a cess.

24871. I was trying to get from you whether, at this moment, the Act is part of the law of the Province?—It has not been enforced yet.

24872. *Sir Henry Lawrence*: What further steps are necessary before it can be put into force?—Rules have to be framed by the Local Government under the Act; the rules have not yet been framed.

24873. Is that the only thing that is wanting?—Yes.

24874. *Prof. Gangulee*: You propose to levy a cess?—Yes; only the skeleton Act has been passed.

24875. You are going to have a definite cess?—Yes.

24876. *The Chairman*: In the meantime, I take it there is no free primary education?—No.

24877. What do you say about the water-supply in the villages on the plains?—The Local Boards construct wells and tanks in the rural areas for the provision of drinking water, but I think these wells and tanks are not properly looked after; the difficulty is that the people contaminate the water. I think there is a sufficient number of wells and tanks, but the great difficulty is to protect them from contamination.

24878. Do you expect that one of the results of the passage into law of the Assam Rural Self-Government Bill, which is at present before His Excellency, might be the creation of village authorities capable of taking charge of matters like water-supply?—That is what it is meant for, but, as I have already stated in my replies, to make the new legislation more effective you must have closer co-operation and closer control by the District Officer.

24879. You do not think that the villages would be able to supply sufficiently active management to control their own affairs?—That is also the case. Again, generally we find that there is much dissension in these villages. Unless there is somebody who is above petty quarrels and feuds the working of these village authorities will never be satisfactory.

24880. *Prof. Gangulee*: What is the nature of the feuds? Are they communal?—They are not communal, but there are generally two or three influential men in the village, each having his own following; it is not communal.

24881. *Sir James MacKenna*: You have got a large number of duties. How much time are you able to devote to the duties of Director of Agriculture?—My duties as Director of Agriculture occupy about half of my time; the other half is devoted to the two other departments.

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24882. Do you think that the work of the department is sufficient to justify a full-time Director of Agriculture?—A full-time Director would have been appointed long ago, had it not been for the retirement of Mr. Birt, who was the senior man in the Indian Agricultural Service, and he retired on proportionate pension.

24883. On account of ill-health?—Yes; and then, this post has remained an I.C.S. post.

24884. It was made an I.C.S. post?—Yes; as a matter of fact, it has all along remained an I.C.S. post.

24885. Do you think, if it were made a full-time appointment, there would be work enough for a full-time Director?—I myself think that, unless the staff is properly and fully developed, there will not be sufficient work for a full-time Director. It is only a question of expense; if sufficient money is provided, the staff and the work can be fully developed, and then there will certainly be work for a whole-time Director.

24886. Till that full development comes about, would it not be better to have a specialist as Director, who would also do a certain amount of research?—That, I think, would be more useful than the present state of things.

24887. Have you any views about the training of your staff locally? Do you think that the establishment of a small agricultural education institute, for the purpose of training your own staff, is possible, within the finances of the Province?—Is that with regard to the subordinate staff?

24888. Up to the provincial grade?—I do not think we can have an institute of that kind.

24889. In that connection, you seem to think that Pusa ought to take up the training of your subordinates. Would it not be degrading Pusa from the position of a station for post-graduate training and research work to the level of a provincial college?—They ought to provide training for men in Provinces like Assam, which cannot afford to bear the expenditure of having a separate college of their own; it is not intended for the bigger Provinces.

24890. In consideration of the financial position of little Provinces, Pusa might alter its cast-iron ideas in regard to education?—Yes.

24891. In your printed memorandum, you say that at present the only superior officer in the scientific staff is the Botanist. You do not get any service from the Deputy Director as a scientific officer?—He is entirely occupied with administration and demonstration, and he is not doing any scientific research.

24892. You are of opinion that your Chemist, Entomologist, Mycologist and Livestock Expert should belong to the Provincial Service?—On account of the paucity of funds, I say that that should be so. We cannot possibly pay for Indian Agricultural Service officers in all these branches.

24893. That is on account of the financial position?—Yes; only on account of the financial position.

24894. Can you tell me how many of your officers are engaged on research as opposed to administration?—We have besides the Botanist, as I have said, a Chemical Assistant, an Entomological Assistant and two Botanical Assistants.

24895. These are the research men. Have you a research man on the agricultural side? Is any research work being done on agriculture pure and simple?—None.

24896. Are any field experiments being conducted?—Field experiments are conducted by the Superintendents and Inspectors.

24897. Cannot these do research?—I do not call them research officers; I call them officers for administration and demonstration.

24898. Has there been any development of the 'agricultural association' idea in the Province?—We have not started any agricultural associations.

24899. Is any interest being taken by large landholders in agricultural improvements?—There are large landholders in this Province.

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24900. Are they taking any interest in the improvement of agriculture?—Except one, I have not seen that any of them are; the Raja of Gauripur is taking an interest and his Dewan will appear before the Commission as a witness.

24901. What is the nationality of your staff?—In the Surma Valley they are all Bengalis; in the Assam Valley, they are mostly Assamese, both Hindus and Mahomedans; in the hill districts they are hill men.

24902. They more or less vary according to the geographical boundary?—Yes; otherwise, they cannot get on with the cultivators owing to the language difficulty.

24903. Would you say that Pusa has been of substantial assistance to Assam in any branch of research?—Nothing of research has been done on our behalf by Pusa, but Pusa is not to blame for that; we have not asked them to undertake any research, as far as I know. I have been in charge for three years, and during that time we have not asked for any assistance, except for combating the potato blight disease; they sent a man for that. I asked for assistance for cattle improvement, and they have given us assistance; as far as I am concerned, I have nothing to complain about.

24904. They have been of substantial help to you in the matter of research?—Yes.

24905. In your printed evidence, you refer to the great depredation by wild animals in this Province?—Yes.

24906. Have you any experience of the superiority of the Coimbatore canes as against jackal attacks?—We have already introduced Coimbatore canes and we are trying them in our Jorhat farm, but the *tana* variety seems to be more immune from jackals.

24907. On account of its harder skin?—Yes.

24908. *Prof. Gangulee*: The *tana* variety comes from Bengal?—Yes.

24909. *Sir James MacKenna*: What about cattle improvement? Has the question of improving the buffaloes been taken up by this Province?—No, but we have made a preliminary inquiry about buffaloes by deputing one of our officers.

24910. What is the number of buffaloes, roughly?—In 1925 there were 212,000 male buffaloes and 239,000 cow buffaloes.

24911. What is the number of bullocks?—The number of bullocks in 1925 was 16 lakhs, the cows 17 lakhs and the young stock 15 lakhs.

24912. So that oxen predominate very largely?—Yes.

24913. Have you considered the question of improving the buffaloes?—It is rather a pity that the local breed of buffaloes is disappearing. As the jungles are being cleared, they are also disappearing.

24914. *Sir Henry Lawrence*: What makes them disappear?—They are not used to living in the open country. They want marshy jungle to live in. These herds of buffaloes are good milkers and they generally keep them in the jungle. Now our jungles are being cleared up. Year after year the Eastern Bengal emigrants are taking up land and it is very difficult now to keep that kind of buffalo.

24915. *Sir James MacKenna*: Do your large landholders take any particular interest in cattle-breeding?—No.

24916. Just one last question about co-operation. Do you use your co-operative stores as a means of disseminating improved seeds and things like that?—Improved seeds were distributed through the societies and so also were implements.

24917. Is that an increasing business?—It is increasing. We started these societies only a year ago and the total value of supplies during last year amounted to Rs. 10,000.

24918. Is any particular interest manifested by district officials, as apart from non-officials, in the operations of the Agricultural Department, officials such as Deputy Commissioners and Sub-divisional Officers?—The Deputy Commissioners of the hill districts and particularly those of the Naga Hills, Garo Hills and Lushai Hills are in charge of the agricultural operations themselves.

24919. So they do take interest?—In the plains they do not take much interest.

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24920. That is probably because you have got a small department which is not very much in the public eye?—Yes.

24921. *Prof. Gangulee*: You have a Development Board in this Province?—Yes, we started it a few months back.

24922. What is the constitution of this Board?—I am on the Board; there are two officers of the Agricultural Department, two officers of the Industries Department, two officers of the Co-operative Department and the rest are non-officials elected by the Local Legislative Council.

24923. What is its function?—The function of the Board is to advise with regard to all activities of the three departments.

24924. So, it is merely an advisory body?—Yes.

24925. And you are on the Board?—Yes, I am the Chairman of the Board.

24926. Returning to the Agricultural Department, you said you have four farms in this Province. I am not clear in my mind as to who conducts the experiments on these farms? Who is in charge of the experiments?—There are different kinds of work. For instance, in the Upper Shillong farm there is potato cultivation and in the Titabar farm there is rice cultivation. Then the botanical portion of the work is under the Botanist who has got subordinate officers in each farm; the botanical work is done by him through these subordinate officers.

24927. Take, for instance, the Upper Shillong farm. You carry on certain experiments with potatoes. Who is in charge of that? Who plans out the experiments and records their results and so on?—The Deputy Director is in charge of that. The farms are directly under the control of the Deputy Director.

24928. And you have got two Deputy Directors?—Only one at the present moment.

24929. With regard to the method of demonstration, I am not quite clear in my mind as to what methods you actually follow when you say you demonstrate on the cultivator's own land?—Each demonstrator is given a certain group of villages and in that area he has to demonstrate. Each demonstrator may have 20 or 30 demonstration plots within that group. In one plot he may be demonstrating rice, in another plot he may be demonstrating sugarcane and in another plot something else. In one plot he may be demonstrating simply the preservation of manure and in another he may be demonstrating the growth of fodder crops.

24930. What are the qualifications of these demonstrators?—They are generally educated in the vernacular and they undergo a year's training on one of our farms.

24931. When they do their demonstration work, is it supervised by anybody?—It is supervised by the Inspector and the Superintendent and also by the Deputy Director.

24932. Chiefly by the Agricultural Inspector?—Yes.

24933. You have got 15 Agricultural Inspectors and they supervise the demonstration work of these demonstrators?—Yes.

24934. Have you followed up your demonstrations in any particular area? For instance, one season you demonstrate. Do you follow up that demonstration in the next year?—Yes.

24935. So there is continuity and also concentration of work?—Yes.

24936. With regard to the machinery for the distribution of seed, you said you have got the co-operative organisation through which you distribute seeds?—Yes.

24937. That only applies to the members of the co-operative societies?—The seeds are also given to non-members. The difference is that the members of the societies get them at the price fixed by the Agricultural Department, while to the non-members they are allowed to sell at a small profit.

24938. Do I understand that this distributive machinery helps the small cultivator?—It helps the small cultivator.

24939. Does he get the seed?—He gets the seed and he has this advantage that he does not pay cash for the seed. The society advances the money and he has to pay the value of the seed after the harvest is over. That is the great advantage in distributing seed through the society.

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24910. With regard to these farms, do you keep an accurate account for each group of cultivation?—Yes.

24911. Do you publish these accounts?—They are not published now but we used to publish them.

24912. So you are now in possession of certain data with regard to the farm economics of units of cultivation in different areas?—Yes.

24913. In this Province, I think there is a great deal of scope for fruit cultivation. Do you agree with that?—Yes.

24914. I find that as early as 1895 you had a garden plantation of oranges?—Yes.

24915. You had a fruit garden called La Chaumiere garden and on that garden the work has now been abandoned; is that the position?—Yes.

24916. Why has this garden been abandoned?—Because the Legislative Council refused to vote supplies for it.

24917. What was the motive behind that?—I do not know; but the Legislative Council refused supplies and so we had to abandon it.

24918. So it is now leased to a private person?—Yes.

24919. Supposing the Assam Government should want to carry on fruit farming again, have you got any record of past experiences, and the results of past experiments?—We have got the records and the present lessee has got all the records of the Shillong fruit garden here.

24920. So these past experiments are not lost, you have them on record and can utilise them?—As a matter of fact, we have even now two or three more fruit farms under the department. We have one orchard in Haflong and there are some other orchards in the hills under the management of the Deputy Commissioners.

24921. You have no horticulturist in charge of these farms?—We have a Fruit Inspector.

24922. What education has he had?—He is a graduate of the Nagpur College. He had some special training in orange culture at Nagpur.

24923. You are carrying on experiments with oranges?—We are trying to make budded grafts.

24924. While we are discussing this fruit question, may I know if there has been any decided improvement in the packing of fruits?—It is very defective. Both the packing and the method of transit are very defective.

24925. Are you paying any attention to that?—We have not been able to pay much attention to that because the packing and other things are done by the traders themselves.

24926. You say in your note that a large number of people are migrating from Eastern Bengal and are settling down permanently in this Province. What assistance do you give to these settlers?—You mean from the department?

24927. Yes?—From the department they get seeds whenever they ask for them. For instance, they require largely the improved variety of jute. They have come from Bengal and in Bengal probably they were getting their supply of seed from the department; they want the same thing done here.

24928. They seek your assistance?—Yes, and they are starting societies among themselves also.

24929. They are all *khadyalog*? They belong to the educated class?—They are all small cultivators, mostly Mahomedans.

24930. On what conditions do they come and settle down here?—They can get land simply by squatting. They have not got to apply but they have to clear a patch and at the time of annual settlement the officer comes and simply records the land.

24931. There is no permanent right in the land?—Until the next resettlement they get only annual leases as they do not stick to one place. They clear a patch of jungle and cultivate it for two or three years, and if they find the land suitable they stick to it; otherwise they move to another plot.

24932. Are you now referring to the practice of *jhuming*?—*Jhuming* is not done by the plain people but it is done by the hill people.

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24963. What kind of farming do these emigrants practise?—They cut down the reeds and pick up the stems and then they cultivate.

24964. They do not acquire land from the Government or from any other authority?—They occupy Government land.

24965. They are mostly Mahommedans?—Yes.

24966. Illiterate?—Yes; all illiterate.

24967. Wholly illiterate?—Yes; entirely illiterate.

24968. You have about 18 million acres of culturable waste, I understand?—Yes.

24969. What is the nature of that soil?—A large part of it is marshy, requiring to be drained; it is fit for jute and also mustard in the winter.

24970. With regard to communications in this Province, river communication is the chief means?—It is the chief one in the Surma Valley. But in the Assam Valley road communication is more important. Of course we have got the Brahmaputra river, but the smaller rivers are not fit for navigation throughout the year.

24971. You have emphasised rightly in your note the need of storing natural manure. I think you are referring to cowdung?—Yes.

24972. Are any experiments being made to show the cultivators how to preserve this important manure?—Yes; we have had covered manure pits made in many centres.

24973. With regard to animal husbandry, you say you have, in this Province, professional breeders who are Nopalis. Do they visit your breeding station?—No; they live far away.

24974. Are you in touch with any of the professional breeders?—I have visited some Khutis to find out what they do.

24975. You have some data as regards their methods?—Yes; I know their methods; they are not amenable either to advice or anything else. They are not under our control at all.

24976. One question with regard to marketing. You say that the Marwaris are in your markets, and that they have a net-work of organisation and deal with agricultural produce. What is the chief produce they deal with?—They deal with all the produce that is exported, viz., rice, paddy, mustard, jute, potato, etc.

24977. Fruits?—By fruits I mean oranges; they do not deal with oranges.

24978. You have no co-operative sale societies in this Province?—No.

24979. You think there is a great deal of scope for them?—Yes; but they require expert business management, and how can I start them?

24980. *Mr. Calvert*: The Director of Land Records has given us a note suggesting that fragmentation of holdings is a considerable evil in this Province. Have you yourself made any special enquiry in the villages on this point?—I have not made any special enquiry but I had been to places where the population is rather dense and holdings are small. I have seen that myself. It is not a general evil; it is confined only to the districts of Sylhet and Gauhati as far as I know.

24981. In Sylhet, where you have small holdings of 4 or 5 acres, in how many different places would those 4 or 5 acres be scattered, 14 or 15?—Say, 10 to 20.

24982. It is quite a serious evil?—Yes, it is quite serious.

24983. And do you not consider it feasible to undertake consolidation?—I think it is possible; the only thing is we are under-staffed. With the necessary staff I shall be able to take up the work not only in Sylhet but also in the Assam Valley. My opinion is that consolidation should be started at once.

24984. In discussing co-operation, you say that a considerable number of members join societies merely for the sake of co-operation; not to borrow?—Yes.

24985. Does it mean that there is nothing mutual between these two sections of members of the society?—I refer in this particularly to the Assam Valley where it is very noticeable. In the Surma Valley, the practice

is more or less akin to that of Bengal; only the borrowers join the society. In the Assam Valley, they think that if they do not join the society they will be rather looked down upon.

24986. But do they themselves get an economic advantage from their membership?—Those who do not borrow, do not get much advantage; but still they take up unlimited liability.

24987. On the question of economic enquiries you say, "Such enquiries will be largely suspected and I do not think that very reliable information will be collected." Is that information based on your experience or is it a mere opinion?—This Province being a temporary settled and ryotwari one, the people always suspect such enquiries and they think that such enquiries will lead to some enhancement of land revenue. That is why I say that any sort of economic enquiry will lead to suspicion in the minds of the cultivators.

24988. That is a pure theory and it is not based on experience?—Yes; I have not started any enquiry myself.

24989. You said, I think in reply to the Chairman, that you had one Assistant Registrar and nine Inspectors?—Yes.

24990. What are the qualifications of the Assistant Registrar?—He is a Sub-Deputy Collector.

24991. Is he a graduate in economics?—No; he is a graduate in science, a B Sc.

24992. Is he a student of economics?—He has been in this department for the last four or five years and during that time, of course, he has studied economics to a certain extent.

24993. And the nine Inspectors?—They are all graduates.

24994. In economics?—No, not necessarily in economics; some of them are graduates in economics, but all are not.

24995. From what class are they drawn? Are they drawn from the actual cultivating class?—No; they are all of the *bhadralog* class.

24996. So practically your staff is of a different class from the co-operators?—But they are in touch with the actual agricultural classes, of course.

24997. But they are of a different class?—Yes.

24998. Do you think there is complete sympathy between the staff and the co-operators?—I think there is; but I think they require training in agricultural economics.

24999. Do you have any method such as a course of lectures for keeping your staff up to date?—No.

25000. Do you test the knowledge of your staff at all?—I have just now proposed that they should undergo a departmental examination in rural economics.

25001. At present you have no special class?—No.

25002. Have you got a good library?—Except the library in my office there is none else.

25003. Is it an extensive library?—Fairly extensive with regard to co-operation; but then Agricultural Inspectors are supplied by the department with all the co-operative magazines that are published in India.

25004. But do you insist or take any measures to insist that your Inspectors regularly study new books on co-operation?—I have no means of insisting on that; but of course, I supply them with new books and magazines and their knowledge is tested when they answer the audit notes.

25005. Who does the audit?—The Audit Inspectors.

25006. Government-paid Inspectors?—Yes.

25007. Do the societies pay audit fees?—Yes.

25008. Those fees go to the Government?—Yes.

25009. Is the whole of the audit fee expended on audit?—The Inspectors do the audit as well as the inspection and the whole of the audit fee is spent on the Inspectors' pay.

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25010. Is your Provincial Bank audited by your staff?—Yes, it is audited by my staff; we have got a Provincial Auditor for that; he is the only man in the audit staff who does the audit of the Provincial Bank and all the Central Banks.

25011. What are his qualifications?—He is an Accountant and he was trained in co-operative audit work in Bengal.

25012. He is not qualified under the Companies Act?—No.

25013. Is there any system of super-audit?—Yes; super-audit is done by the Assistant Registrar and by myself.

25014. Do you find the audit reliable?—Yes; I think it is reliable; so far we have not been able to find many mistakes in audit.

25015. To what extent have you any system of educating your members systematically in rural economies?—The Inspector sometimes goes and collects the members and delivers lectures to them during the course of his inspection; that is the only method.

25016. If, for instance, there is a society and a suggestion is made of putting a cess on the export of agricultural produce in order to finance the Agricultural Department, would they be able to discuss that intelligently?—I think they would protest against it.

25017. Could they discuss it intelligently?—I do not think so.

25018. Could they point out the fallacy?—I do not think they would be able to do it; they would simply take it as another form of taxation.

25019. Would they know who would pay it?—Yes; they know they are going to pay it ultimately; they know that at least.

25020. Is any attempt being made to study grasses in Assam?—You mean fodder grass?

25021. With a view to laying down land to pasture?—No.

25022. Has anything been done in Assam to lay down proper pastures?—No; only certain pastures have been reserved, that is all.

25023. I mean by pasture selected grass being put in in the place of wild grass?—No.

25024. With regard to your land mortgage bank, you say it is financed by shares and deposits; for what term are these deposits held?—Now the shortest period is five years.

25025. Are you getting a fair amount of five-year deposits?—Not much; they intend to reduce the period to three years, but the period of repayment is ten years; that is the trouble.

25026. Can an individual be a member both of a village primary society and of your land mortgage bank?—Yes.

25027. He can borrow from both?—Yes; but he will borrow from the co-operative society for agricultural purposes, whereas the land mortgage bank is not meant for that; it is for debt redemption, improvement of land and so on.

25028. Does the village society have any say in the matter of getting a loan from the land mortgage bank?—The by-law is that when a member of the village society wants a loan from the land mortgage bank a reference will be made to the society before issuing the loan.

25029. What is the liability of the land mortgage bank?—The liability will be half.

25030. Limited liability?—Yes; half will be uncalled; that is what I understand; half will remain as reserve liability.

25031. What security are you taking in your land mortgage bank?—Immovable property. The by-law is that money can be advanced up to 50 per cent of the value of his immovable property.

25032. The whole of his property?—No, the property offered.

25033. You do not insist on his mortgaging the whole of his landed property?—No.

25034. Do you take personal security in addition?—No.

25035. What will happen if a man fails to pay his instalment?—It will have to be recovered from the property.

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25036. You take over the land?—Yes, the land will be put up for sale and if nobody purchases, the society will have to buy it.

25037. In your note, you say that of the 12 lakhs of capital in the movement about one-third, say, 4 lakhs, is owned; that 4 lakhs is available for long-term loans?—Yes, it is available.

25038. In Assam, you have the system of recovering arrears as arrears of land revenue I think?—No, it is under the Public Demands Recovery Act, only on dissolution.

25039. Only on liquidation?—Yes.

25040. Do you find that power valuable?—No, it is not satisfactory.

25041. Do you recommend this compulsory collection through the Collector in the case of liquidation?—In case of liquidation I do; as a matter of fact I am revising the Co-operative Societies Law, and I have already submitted a Bill in which I have provided that power in case of liquidation.

25042. Not in the case of bad debts?—No.

25043. Mr. Kamat : You hold three posts?—Yes.

25044. Is it a permanent arrangement that one man should hold three posts, Director of Agriculture, Director of Industries and Registrar of Co-operative Societies?—This has been going on since 1923.

25045. I want to know whether it has been decided by the Assam Government that this is to be a permanent arrangement?—So far it is a permanent arrangement.

25046. Do you think a man who holds these three posts can do justice to all the three departments?—Provided he has a sufficient and adequate staff of experts, I do not think it is very difficult.

25047. In the long run, is it sound economy?—It ensures co-operation of the three departments much better than any other way that I can see.

25048. Supposing a separate officer were appointed to be the Registrar, a full-time Registrar of Co-operative Societies, would not the movement benefit?—I agree with you there, and as a matter of fact probably we shall have to do that, because the societies already number a thousand.

25049. If therefore the societies are to progress and multiply in the interests of the ryot, you think a full-time officer would be beneficial?—Yes.

25050. Roughly what would be the establishment expenditure per month of a full-time Registrar with a subordinate staff?—That will have to be calculated, because he would require a separate office, office staff and all that.

25051. But it would not exceed Rs. 3,000 to Rs. 4,000 per month, roughly speaking?—No; it would not exceed that.

25052. It means that a full-time Registrar of Co-operative Societies would cost about Rs. 48,000 to Rs. 50,000 per annum to the Government?—Including his staff, of course, it would be more than that; there would be his staff of inspectors and Assistant Registrars.

25053. Would it not be a good investment for this Government if they spent Rs. 60,000 more for the promotion of the co-operative movement in this Province?—In my last report I have already suggested that, that the Registrar should be whole-time now.

25054. Has your suggestion been rejected, or what?—I do not know; I think they are thinking of having a Deputy Registrar, but I could not tell you definitely on that point because it has not yet come up to me.

25055. They want to give you merely a Deputy Registrar?—Yes, I think that is the idea.

25056. Will you please tell me how much time you can devote to industries as Director of Industries?—Very little. As Director of Industries I sometimes go and see the technical schools that we have got and I also sometimes have to see peripatetic weaving demonstrations, but I can find very little time.

25057. But during your time, have you really considered the question of initiating a single industry in Assam?—I have been in the Industries

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Department ever since the creation of the department, and all these technical schools and peripatetic parties have been established by me. Previous to that there was nothing.

25058. That is inspection work; I want to know whether you have considered the problem of initiating a new industry which might be carried on in this Province?—You mean a large industry?

25059. Certainly?—Of course, we tried to initiate one large industry, the paper industry, in Assam, but it failed. Beyond that we have not started any other large industry.

25060. Unless the officer who is the Director of Industries possesses scientific and technical knowledge, do you think he can do justice to that task?—He cannot; the needs of the Province are such that probably Assam requires about twenty chemists to study different possible industries.

25061. So that this system of combining the positions of Director of Industries, Director of Agriculture and Registrar of Co-operative Societies is nothing more than a nominal arrangement; you do nominal work as Director of Industries; is that correct?—I simply do the inspection and organisation work, the administration work.

25062. Have the Assam Government considered whether this work could not be done by some other officer in addition to his own work?—The idea of the Assam Government is that the Director of Industries should confine himself to cottage industries which are subsidiary to agriculture, and that larger industries should be left to themselves. I have nothing to do with the tea industry even.

25063. You told us you were not in charge of the lac industry?—No, I am not.

25064. That is considered to be a major industry, is it?—No, it is no doubt a subsidiary industry, but the difficulty is that there is no expert to do the work.

25065. It seems to be anomalous that even this so-called subsidiary industry is not in charge of the Director of Industries?—Besides lac, there are other subsidiary industries which might be developed but which are not being developed for want of men and money.

25066. Then would it be correct to say that although you are in charge of these industries, owing to want of men or money nothing has been done with reference to subsidiary occupations?—Except handloom weaving and sericulture.

25067. In the matter of handloom weaving, will you kindly tell me what has been done by your department?—We have three weaving schools and three peripatetic weaving parties under a Textile Expert; we are introducing fly-shuttle looms; we have, as a matter of fact, introduced a very large number of fly-shuttle looms.

25068. Have you done anything with regard to poultry keeping?—No.

25069. Have you done anything with regard to bee-keeping?—With regard to bee-keeping also we have not done anything.

25070. With reference to your demonstration work, do you know there is a feeling prevalent amongst cultivators that when you say a particular experiment is successful from the financial point of view they suspect your accounts; is that feeling common in this Province?—I do not think there is such a feeling. There is a feeling that, if land is made to yield more, probably the land revenue will be increased; there is a feeling of that sort.

25071. No, I am not referring to that. Your demonstration work, to be really successful, must show better results financially in crop yield than the cultivator obtains by his own methods?—Yes.

25072. But, at the same time, you must keep the expenditure on a level with the expenditure of the peasant?—Yes.

25073. When you show the peasant your expenditure, does he scrutinise the whole thing, and is he satisfied that your accounts are correct?—Yes, he is satisfied; otherwise he would not take up the method. For a year now we have not been concentrating so much on methods as on better seeds, and the fact that there is a demand for these seeds goes to show that he has calculated everything and finds our seeds to be more paying.

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25074. With equal expenditure the seeds give better results?—Yes.

25075. That is the net result of your demonstrations?—Yes, the net result with regard to seeds, and I might mention also with regard to implements; for instance, the sugarcane crushing machine has been largely in demand.

25076. *Prof. Ganguly*: Who introduced those machines?—We introduced them; we had them made specially and now we are getting them prepared at Calcutta.

25077. *Mr. Kamat*: With regard to these implements and the demonstration thereof, what are the different implements you demonstrate from place to place?—We demonstrate mostly the sugarcane crushing mill. We have not been successful with other implements; they are not taken up.

25078. You have not been able to make the improved ploughs popular?—No; because the ploughs are too heavy for the cattle.

25079. The improved ploughs are unsuitable for the cattle of this Province?—Yes, unsuitable.

25080. And therefore you have given up the idea of introducing them?—We have given up the idea of ploughs.

25081. Then you do not want an Agricultural Engineer or a man who can devise or change the designs of implements?—No, I have already said that is a matter which should be studied by a special officer with reference to Assam conditions.

25082. With reference to what other implements?—With reference to all implements; there must be a study as to what implements would be suitable for the climate, for the soil and for the draught animals of Assam.

25083. With reference to the depredations of jackals, have you attempted any method of co-operative fencing or anything of that sort?—No, it has not been tried. Jackals do damage mostly to the sugarcane crop, but the sugarcane crop in Assam is not permanently grown in one place; that is the difficulty with regard to fencing.

25084. The result at present seems to be this, that although you say the Coimbatore varieties of cane are good for this Province, you do not introduce them or popularise them merely because of the jackals?—Our experience is that Coimbatore canes are not so resistant to jackals as other canes.

25085. The jackals are apparently neutralising the work of Coimbatore?—They are; they are neutralising the benefit to be derived from all the improved varieties of cane.

25086. Have you concentrated your mind on combating the jackal trouble?—The only way is to distribute a kind of sugarcane which cannot be damaged by jackals.

25087. You say the co-operative movement has failed in some places because of the large sums of money being issued as *taccavi* loans?—No, I do not object to the issue of loans; I object to wholesale remissions.

25088. With reference to agricultural indebtedness, you say one of the causes of borrowing is payment of land revenue and rent. Is that a serious problem here?—Yes, some borrow to pay land revenue or rent to their landlords.

25089. But are a large number of persons driven to borrow owing purely to the necessity of paying land revenue?—Not a large number; it is one of the causes of borrowing.

25090. But is it a general cause or quite an exception?—It is more or less general.

25091. You are not in favour of legislation with reference to fragmentation of holdings. Will you kindly state the reasons why you think legislation would be undesirable?—Because I have not been able to find out what manner of legislation would be effective.

25092. But if legislation were framed by some person of ability, you would not be opposed to it as a matter of principle?—No, I should certainly not be, provided it is feasible.

25093. If somebody devised a Bill which was feasible, you would not object to it merely on the ground that it was legislation?—No, I would

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25094. Turning to Government assistance to minor industries, you are in favour of abolishing the lac duty. Will you explain how that would help the general interest of the taxpayer?—At present we are levying a lac duty, but we are doing nothing to improve the industry. If we are not going to do anything for the industry, the duty should not be realised; that is my opinion.

25095. You do not want this duty, because it is not being spent on the lac industry?—That is the point. Also the duty falls heavily on the industry; the price of lac is very fluctuating.

25096. Do you mean that the lac industry suffers merely owing to this duty?—Not merely owing to the duty, but the duty is also a handicap to the industry.

25097. If the duty were abolished, do you think the lac industry would so prosper that the Province would benefit?—The duty brings in about two lakhs of rupees.

25098. You say there are very few people in Assam who are landless. Is that the reason why they do not go to the tea plantations as labourers and the tea gardens have to import their labour?—The tea-garden labourers are called "coolies," and the Assam cultivators do not want to be called "coolies."

25099. But economically, would they be better off or worse off by going to the tea gardens?—Economically they would earn a good deal more if they went to the tea plantations.

25100. If they care to go to the tea plantations, they will earn much better money?—Yes. They do not want to go as permanent labourers; even as daily labourers very few of them go.

25101. Could you give me a comparative idea of how much they can earn if they remain in the fields and how much if they go to the tea plantations?—If they go to the tea plantations, they can earn double of what they earn by staying at home.

25102. It is the mentality of the people which keeps them poor?—Yes.

25103. On the question of general welfare work in the rural areas, you complain that there is lack of interest on the part of non-officials in this Province in rural reconstruction work. That is because this Province is generally backward in education; is that the idea?—I do not know if that is so; but people, whom you may call politicians, never go to the villages except during the elections.

25104. And they do not interest themselves in the village work?—They do not.

25105. How many colleges have you in this Province?—Two.

25106. And a large number of graduates coming out every year?—Yes, large of course compared to the population.

25107. What do they aspire to?—Some of them aspire to Government service; some take to professions as, for instance, law.

25108. It seems, therefore, that public opinion is backward in this Province?—To a certain extent it is backward.

25109. *Rai Bahadur R. M. Das*: You say something about demonstration farms. Have you got demonstration farms in this Province?—We have no demonstration farms.

25110. Are you going to have any in the near future?—The Development Board have suggested the establishment of demonstration farms in every district; that will depend on Government finding the money.

25111. Are you not very much handicapped in your work for want of Government demonstration farms?—I think I have already said that we want demonstration farms, the object being to show to the people that agriculture is also paying, that is, to make them understand that manuring and better method of tilling will pay. At present, our experimental farms cannot be demonstrating centres because we incur a lot of expenditure on them.

25112. You have demonstrations carried on in cultivators' own holdings. Are any difficulties experienced in having such demonstrations in cultivators' fields now?—The demonstration plots in cultivators' fields are very small, but in a demonstration farm it might be possible to show on a larger scale the use of improved implements, for instance, tractors.

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25113. Are not the cultivators often reluctant to accept your seeds?—They are reluctant, and we have to give them seeds free; when they find the seed is good after trial, then they come in for it.

25114. Do not your officers find that the cultivators generally assign the worst plot of land for your seeds?—That is a fact. The cultivator's holding is small, and he cannot afford to risk an experiment on a part of his holding; so generally he sets apart the worst portion of his land for the experiment.

25115. Is the sowing of your seeds taken up after the cultivator has finished sowing his own seed?—That is also generally the case.

25116. So that your seeds do not get a fair trial in the cultivators' fields?—Our demonstrations in cultivators' own fields do not always get a fair trial.

25117. So, the result is often poor?—It is not often poor. The demonstrations are not a failure everywhere; they are, I think, generally successful in spite of the drawbacks.

25118. But your seeds cannot get a fair trial in the cultivators' fields?—Not in every case.

25119. Supposing you had a demonstration farm of your own, you could have demonstrated your seeds much better than you have done in the cultivators' fields?—I would not abolish demonstration plots when I get demonstration farms. I would have demonstration farms in addition.

25120. What do you think of the idea of guaranteeing the cultivators against any loss they might incur in having your seeds tried in their fields?—It is in a manner guaranteed though not on paper; it is understood.

25121. Do you actually make up any loss the cultivator suffers?—No; so far we have not made up any loss. There has not been any demand for any compensation.

25122. What seeds are most in demand in this Province?—Jute and paddy seeds, potatoes and sugarcane setts.

25123. What arrangement have you got to produce each kind?—We produce some in our farms and some we get through selected cultivators.

25124. What do you mean by selected cultivators?—I mean cultivators whom we can trust to keep the seed pure. From them we get supplies by purchase.

25125. Do you grow all the potatoes you supply from the Shillong farm?—We grow only a small percentage; the rest we get from cultivators in the Khasi Hills district.

25126. How do you certify the purity and superiority of the seeds if you do not grow them?—It is difficult to certify in the case of potatoes grown in so many different places, but as far as possible our Inspector goes and sees the crop when it is growing.

25127. Are you aware that the members of co-operative societies in the Surma Valley are reluctant to buy your seed potatoes because they are found to be unprofitable on account of the high percentage of rotting?—The difficulty is the transport from the hills to the Surma Valley. In the Assam Valley it is easy. The difficulty of transport to the Surma Valley is very great and the seeds rot before they reach the Surma Valley. That is why our seed depôts also incur losses.

25128. From where do you get your jute seed and sugarcane setts?—The jute seed we get now mostly from two private farmers who have taken up farming on a large scale in the Kamrup district with motor tractors and improved machinery, and are growing improved seeds. We are getting our supplies of jute seed mainly from them, but sometimes we get seed from Bengal. The tana sugarcane we get from Bengal, and the other varieties we are growing in Jorhat; we also get them from cultivators.

25129. How do you certify about the purity and the superiority of the seeds if you do not grow them under departmental supervision?—Of course there is difficulty in certifying the purity. When distributing these to the cultivators, no certification is necessary.

25130. What is the best possible arrangement which can be made to grow better sugarcane setts, jute seeds, and paddy seeds in this Province?—The establishment of seed and demonstration farms will go a great way to meet this difficulty.

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25131. Where do you get your supplies of pulse seeds from?—Pulse seeds we generally get from Bihar, but we are not distributing much.

25132. How do you certify their purity and superiority?—There is very little demand for pulse seeds. The same is the case with regard to tobacco. We get them from Bihar from the Department of Agriculture.

25133. Do you aim at a profit in distributing superior seeds from the seed depôts?—No ; we do not aim at a profit ; but we want if possible to defray the cost!

25134. Are your officers under the impression that they must anyhow make the seed depôts profitable concerns?—No. It is not the idea to make the seed depôts profitable; the *Agricultural Handbook* states that, in fixing prices, only the actual cost should be taken into consideration.

25135. You do not make any profit?—We do not want to make any profit.

25136. Do you not have any instructions that there should not be any loss?—They are asked to avoid loss as far as possible.

25137. You say that no irrigation has been necessary in this Province. Referring to the Surma Valley, from which I come, is it not necessary for the improvement of the soil in the Valley, that steps should be taken to facilitate the drainage of water-logged areas, the re-excavation of silted up *khals*, the excavation of branch irrigation channels provided with sluices and the erection of embankments where such works are found to be necessary?—They are necessary in Sylhet, because drainage is unsatisfactory for the great part of the year.

25138. You consider that the water-logged areas in the district of Sylhet should be drained off?—Yes, for the improvement of health and for the improvement of the soil also.

25139. There are also silted up *khals* in the Surma Valley which need re-excavation?—I do not know very much about *khals*.

25140. There is also some difficulty about irrigation in the Sunamganj sub-division of the Sylhet district?—That I have already explained. I have said that lift-pumps will be quite successful, though we have not tried them yet.

25141. Do you not consider that the erection of embankments in certain areas is necessary?—Yes.

25142. Do you know that in Bengal there is an Act called the Bengal Lands Improvement and Sanitary Drainage Act? Insanitary swamps are drained off, and it not only improves the health of the people but also the cultivation; it gives facilities to the cultivators to cultivate swampy lands after they are drained off. Are you aware of that Act?—I am not aware of it.

25143. Have you got any Sanitary Engineer in this Province?—Not at present.

25144. Do you think one is necessary?—I could not tell you; we had one for sometime.

25145. Has there been any chemical analysis of the soil of any district?—When we had a Chemist, there was some analysis.

25146. Was the result of such analysis published?—Yes, the results of the Chemist's work have been already published.

25147. Are they published in the vernacular or in English?—With regard to the liming of soils, the results were published in the vernacular as well as in English.

25148. Are the bulletins of your department issued in English or in the vernacular?—They are published generally in three languages, English, Bengali and Assamese.

25149. In your bulletins, is the weight of the produce given in tons and pounds, or in maunds, seers and chataks?—Generally, in the vernacular it is given in maunds and chataks and not in tons, but in English it is given in tons.

25150. Is it a fact that some of your honorary correspondents have complained about this?—I do not remember.

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25151. You have said something about the Khanapara cattle farm. Is it going to be started for improving the breed of draught bullocks only?—Yes.

25152. Is it not necessary that the breed of your milch cow should also be improved?—It is necessary.

25153. What arrangements are you going to make for the improvement of milch cows?—Other cattle farms will be necessary, but for the present we want to begin with draught bullocks.

25154. As regards transport, is it a fact that sometimes the cost of taking a maund of potatoes from Shillong to Gauhati exceeds the value of the commodity paid to the grower at Shillong?—It is so just now, because the price of potatoes has come down; it is Rs. 1-8-0 a maund and the freight to Gauhati is more than that.

25155. Is that not due to the levy of an exorbitant tax on the motor lorries which take the material down to Gauhati? Does not the cost of conveyance absorb a large proportion of the value of the commodity?—Yes, the freight is too high.

25156. Have you got a definite programme for the expansion of the co-operative movement in this Province?—We have not got any definite programme that so many societies will be opened every year or anything like that, but we are progressing and at a steady rate, I should say.

25157. How many co-operative societies have you got now?—The number just exceeds 1,000.

25158. Do you remember for how many societies the MacLagan Committee recommended a separate Registrar?—(One thousand).

25159. You think the time has come for the appointment of a separate Registrar?—Yes.

25160. Do you consider your present staff quite adequate?—No, it is not adequate.

25161. How many Assistant Registrars have you got?—Only one.

25162. Is he in charge of a division?—Yes.

25163. Is not your Assistant Registrar an officer of the Subordinate Civil Service?—Yes.

25164. Are you aware that in other Provinces such officers belong to the Provincial Civil Service?—In some places they belong to the I.C.S. In Bengal, I think it is so. I think the Deputy Registrars are I.C.S. officers in some Provinces, but mostly they are Provincial Service officers.

25165. Your Assistant Registrars are Divisional Officers?—Yes.

25166. Do not your Divisional Agricultural Officers belong to the Provincial Service?—The Superintendents of Agriculture belong to the Provincial Agricultural Service.

25167. For efficient and proper control of the staff, do you not think that the Divisional Officers such as the Assistant Registrars should be recruited from the Provincial Civil Service?—I suggest they should be appointed from the Provincial Civil Service. I think Provincial Civil Service Officers will make better Assistant Registrars.

25168. What auditing staff have you got?—There is only one Auditor paid by Government.

25169. When was he appointed?—I think he was appointed in 1920.

25170. Has not the working capital and volume of business of Central Banks and other non-agricultural societies more than doubled during this period?—Yes.

25171. Do you think the present auditing staff quite sufficient?—The audit of primary societies is done by the staff of Inspectors.

25172. I am speaking not of primary societies, but of Central Banks and non-agricultural societies such as stores?—The work has not doubled; it has of course increased.

25173. Will you please refer to your memorandum; you say it has doubled?—That refers to all kinds of societies, not the Central Banks alone; Central Banks and non-agricultural societies have not exactly doubled.

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25174. The number has considerably increased?—Of course it has increased.

25175. What about the working capital and volume of business?—That has doubled; I was thinking of the number of societies.

25176. I was asking you about the capital and volume of business?—That has more than doubled.

25177. Do you not think that the present staff of one Auditor is inadequate?—One Auditor is now inadequate.

25178. Inadequate to deal with the growth of the business?—Yes, we have to increase the number of Auditors.

25179. Your audit work is done by your Inspectors?—Yes.

25180. In a year, how many days do these Inspectors spend on tour?—On an average, about 220 days.

25181. Will you kindly look up your report, and say how many days they toured last year? I think you said it was 187 days?—Last year, the number of days spent on tour was rather less.

25182. How many days was it?—The average would be something like 150 days last year.

25183. How many societies have been allotted to each Inspector for audit and inspection?—It varies in different localities. In the Surma Valley one Inspector has 183 societies, another has 136 societies, and a third has 121 societies; in the Assam Valley, the charges are 107, 170 and 125.

25184. Do you not think that at least three days are necessary for the thorough overhauling of the accounts of a rural society including the time spent in transit?—That depends on the size of the society. With the smaller societies, even two of them might be audited on the same day, but a large society will require at least two days to audit.

25185. After doing the audit work, is there any time left for the Inspectors to do any propaganda or educational work with a view to the inculcation of co-operative principles in members of co-operative societies?—At present, they have very little time, but we have submitted a scheme to Government for the increase of the number of Inspectors; this increase has been spread over a certain number of years, and we hope to get the first instalment next year.

25186. Do you not consider that the stereotyped work of audit could be done more cheaply by a staff of Auditors who may not be so highly qualified and not so highly paid as the Inspectors?—That was the question which was discussed by the Local Government and the Government came to the conclusion that possibly audit by Inspectors would be more reliable than audit by a poorly paid staff.

25187. Under the present arrangement, as you say, your Inspectors do not find sufficient time to do any propaganda or educational work?—The only remedy is to increase the number of Inspectors.

25188. In the scheme which you have proposed you say that 75 societies should be allotted to each Inspector?—Yes.

25189. Your Inspectors spent about 200 days on an average on tour in the interior?—Yes.

25190. If three days be allotted to each society, then do you think there will be time left for doing any propaganda or educational work after auditing all the societies?—With only 75 societies in their charge, I think they will have sufficient time.

25191. But they will require about 225 days to audit these societies?—They can do a lot of propaganda and educational work along with audit.

25192. Do you not consider that educating the members of co-operative societies is the most important work of the Inspectors?—Yes.

25193. Do you think it is being done now?—During audit they meet most of the members because it is during the audit that they have to verify the loans.

25194. Does not all this work take a long time?—It does.

25195. Does he find sufficient time to do any educational work?—Not at present, as I told you before.

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25196. Can he find time for any organisation work?—Nowadays organisation work is to a large extent done by the Central Banks.

25197. Have they got sufficient staff to do it?—The Chairman of the Central Bank or the Secretary of the Central Bank is an Honorary Organiser appointed by the Government.

25198. Can you say how many societies your Honorary Organisers organised last year?—Last year 66 societies were organised by the Honorary Organisers.

25199. Do you consider that satisfactory?—Out of 138 new societies registered last year, the Honorary Organisers organised as many as 66 which is nearly half the number.

25200. How many Organisers have you got?—Twelve.

25201. So, on an average, they organised five societies in a year. Do you consider that to be a sufficient expansion of your movement?—I am satisfied with the amount of work done by these Honorary Organisers considering that they have also got to attend to their own work. Some of them are business men; some of them are pleaders and some of them are educationists and they have got their own work to attend to. What assistance they have been able to give is, I think, quite satisfactory.

25202. The Chairman inquired from you about the Sarma Valley Co-operative Organisation Society. You know that they have entertained a staff of teachers?—Yes, I know that.

25203. Do you know that this society is languishing for lack of funds? How much do they get from Government?—Last year they got from Government Rs. 1,000. I hope they will get a similar amount this year. They are also getting a grant from the Local Boards.

25204. Do you think they are well in funds?—They are not; it depends on the number of members they enrol.

25205. Do you not think that Government should help this society more liberally?—Government have already granted a sum of Rs. 1,000 and the idea is to watch the progress and developments. If the work is done on right lines Government will certainly encourage this society, as far as possible, with money.

25206. You say that primary education is not free in this Province. Do you know that no fees are paid by the boys who attend primary schools?—Fees are not charged but I think primary education is not quite as free as it is generally understood to be.

25207. The Chairman: You told me that the reverse was the case. What is the explanation?—They have to buy books and paper. Everything is not quite free.

25208. Are there any other charges?—No fee is charged.

25209. So it is only the expense on books and paper that they have to incur?—Yes.

25210. Rai Bahadur R. M. Das: The teachers are fully paid?—They are paid by the Boards.

25211. You said that rural reconstruction work under present circumstances cannot be left entirely to patriotic non-officials. Do you know that there is such an organisation as the Sylhet Social Service League?—I know there is such a League.

25212. Have they taken up rural welfare work?—They have taken up the work, no doubt; but they have not got sufficient men to go to every village.

25213. Do you know they have got a whole-time preacher who goes out and gives lantern lectures on sanitation and hygiene?—They have got a preacher but for a population of 26 lakhs one preacher is not enough.

25214. He may not be enough, but they have made a small beginning. Do you know they have got some night schools?—I do not know of any night schools. My idea is not to underrate the work done by these non-officials but I say that without Government assistance the work cannot be done properly. That is the reason why I want the active support of the District Officer.

25215. Sh Thomas Middleton: I think your department was established in 1882?—Yes.

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25216. It has got a long history. You have published annual reports; have you reviewed your progress in any special reports?—I have given a very brief resumé in the memorandum.*

25217. What I mean was whether at any time during this period there have been periodical reviews?—No.

25218. So, for our information we must go to the annual report or to your special memorandum?—Yes.

25219. You point out that you require at the present time a Chemist, an Entomologist, a Mycologist and Livestock Expert but that your funds do not permit of the appointment of these men. Now, in view of the shortness of funds, which of them would you select first, I want you to place them in order. Which do you think is most necessary for work in Assam?—We want a Livestock Expert and a Mycologist.

25220. Why do you want a Mycologist specially?—Because there are a lot of plant diseases.

25221. Which diseases have you got in mind especially at the moment?—The potato disease, the disease of betel-nut, and the diseases of coconuts.

25222. Are betel-nuts and coconuts important groups here?—Yes.

25223. So these are the two experts that you would select first?—Yes.

25224. You have informed us that your demonstrators are not of the type that you would desire. What salaries are these demonstrators paid on appointment?—They get Rs. 20 and rise to Rs. 50.

25225. What are the schoolmasters in primary schools paid in Assam?—They get on the average from Rs. 11 to Rs. 20.

25226. So that relatively your demonstrators are well paid as compared to the teachers in primary schools?—Yes.

25227. You train these demonstrators by giving them one year's course on a farm?—Yes, they have to be maintained at the farm by means of stipends.

25228. How old are they when you appoint them?—They are generally about 18 years of age.

25229. Are these boys of 18 with one year's training fit to go out and advise, instruct and demonstrate to the cultivators?—I think they are not. My idea is that they are not satisfactory.

25230. What I want to get at is whether it is the want of training or the poor salary that makes them unsatisfactory?—It is want of education and not want of training. If, for instance, they receive some sort of elementary agricultural instruction in the middle school, they will be better qualified after training on the farm to become demonstrators.

25231. Is it want of training or want of money that prevents you from getting the right men?—We might possibly get men from agricultural colleges if we had money.

25232. Of what age would these men from agricultural colleges be?—They might have a separate course in an agricultural college for demonstrators.

25233. Do you think these students from agricultural colleges would be fit to demonstrate to cultivators?—They would have to undergo training on the farm for one year.

25234. You expressed the view that we ought to have in Assam some teaching in agriculture, at least in the middle schools?—Yes.

25235. How many middle schools have you got in view?—I should rather start with one school in each district.

25236. How many districts are there in Assam?—In the plains there are eight districts.

25237. You point out that you could not provide these middle schools with school farms because of the cost?—Yes, a school farm would be more costly than a building.

25238. You also indicate that you require a certain number of demonstration farms in Assam. Would it not be possible to combine these two objects?—It would be possible.

* Not reprinted : Preliminary Memorandum on Agriculture and Rural Economy in Assam prepared for the Commission by the Assam Government.

25239. How many acres of potatoes are grown in Assam?—We can give you figures only with regard to improved potatoes because potatoes are grown largely on the hills for which we have no statistics.

Are there 200,000 acres? I only want a very rough idea. Your total area under cultivation of vegetables is something like 450,000 acres. If you cannot find the figure, please do not trouble to look it up. Let us have the figure later on.

25240. You are now providing 2,500 maunds of improved seed potatoes. How many acres will that quantity plant each year?—That also I will be able to supply.

25241. In any case you are supplying seed for only a minute fraction of the land under paddy cultivation?—Yes.

25242. *Dr. Hyder*: What are you doing with regard to the hill tribes in the matter of agriculture?—We have got our agricultural staff, the Inspectors and Demonstrators, also in the hill districts.

25243. Among the tribes which are under British administration?—Yes, and also outside British administration; the Khasi Hills district is practically outside.

25244. How far is the improvement in agriculture in the Khasi Hills due to the efforts of your department and how far to the Welsh Baptist Mission?—They have not done anything, as far as I know. The potato cultivation is entirely due to the efforts of our department.

25245. With regard to the extraction of lac, is not the duty entirely on produce which comes from the Government forests?—No.

25246. It is on lac extracted from private forests?—Yes, as well as from private lands.

25247. Then with regard to this subsidiary industry of agar, do you know what that is?—Yes; it is entirely from the Government forest.

25248. What are you doing to revive that? I find from the Reports of the Census Department that it was a very important industry at one time?—At present, there is very little demand for agar essence. Originally the demand came from Turkey and Arabia.

25249. What is the customary law of inheritance among the Khasis; they do not subdivide?—The inheritance is through females.

25250. There is no sub-division of the family holding?—There is no sub-division as far as I know.

25251. The youngest girl inherits, is that it?—Yes.

25252. Cannot you improve your milk-yielding areas in the hills; you have got plenty of pasture land, have you not?—That is what we are trying to do in the Upper Shillong farm.

25253. How much will it cost to spray an acre of potatoes with Bordeaux mixture?—I have not calculated that, probably the Deputy Director will be able to tell you.

25254. It is well within the cultivators' means, is it?—Yes; it is probably within their means, but then when they have got large areas possibly they cannot manage to spray the whole lot.

25255. *Mr. Heslett*: As regards the general organisation of your department, I think the main difficulty in Assam is the question of funds and all these departments have been placed under you because the revenues cannot afford to have each subject under a different officer?—Yes.

25256. So unless we can increase our revenues or raise a big loan, we cannot afford to have all the officers who are really necessary?—Yes.

25257. You admit they are necessary?—Yes, but the whole question depends on money.

25258. So that we have here one officer for all the departments while in most of the other Provinces the three departments are separate with possibly an expert officer in charge of each?—Yes; besides I think the idea was to carry on the work under one man.

25259. Yes; the subjects are allied to each other and in that way there is a certain amount of advantage?—Yes.

25260. And you also want to put the District Officer in more direct charge?—Yes.

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25261. That is because you are short of expert staff and because you think the influence of the District Officer will help your departments?—Yes. My idea is also to increase his influence.

25262. And give him really definite control, not merely being an advisory officer? As regards land records the District Officer is definitely in charge of the work in his particular district. Do you think that the District Officer should be definitely put in charge of the work of your departments in his own district? Do you go so far as that?—Not necessarily; but I want his active assistance.

25263. But if you want his active assistance, do you not think that you must give him also some definite control or definite authority?—Some control can be given provided he has got time; but possibly he will have to be relieved of some of his judicial duty, I think, to some extent.

25264. My theory is that the District Officer, having nothing to do now with local Boards and Municipalities (which are now being run under their own non-official chairmen) may have some time now to devote to village reorganisation, co-operative credit, agriculture and that sort of thing. He can do more than he is doing at present?—My opinion is that the Rural Self-Government Bill which has been passed should have been more comprehensive; it should have included not only rural sanitation and medical health but also all other activities.

25265. Would you make the District Officer more or less a departmental head of that organisation?—Yes.

25266. So you would definitely put him in charge of the village reorganisation work including agriculture and co-operative credit as far as possible?—Yes.

25267. *Mr. Calvert*: On the non-technical side?—Yes.

25268. *Mr. Hazlett*: I see that the net cost of your own Department of Agriculture is about 2 lakhs of rupees, that comes to about 1.1 or, say roughly, 1 per cent of the revenue of the Province. Do you think that is a fair percentage to expend on agriculture?—I think we ought to spend a little more.

25269. How much do you think would be a fair percentage of the total revenue of the Province to spend on agriculture?—It is very difficult to say; there are other demands also; but the present expenditure might be doubled if possible.

25270. I understand that some of the Provinces spend 3 or 4 per cent, though Bengal spends 1 per cent. Do you think 5 per cent is too much to spend on agriculture?—I do not think it is too much.

25271. I think 90 per cent of our population is engaged in agriculture?—Yes.

25272. And you think that even 5 lakhs will not be too much to spend in expanding the agricultural resources of the Province?—Exactly.

25273. Of course you have no suggestions as to how this extra money is to be raised, whether it should be by cutting down expenditure on other departments or by raising increased revenue or by increase in taxation for this particular purpose?—I cannot say; increase in taxation will probably be unpopular.

25274. It will be unpopular in the Council Chamber, you think?—We are already levying a cess on tea for instance, and we do not get any part of it for Assam.

25275. You get nothing from the export duty on tea?—No.

25276. But the export duty on lac?—We do not get it either.

25277. That does not come to the Local Government?—No; that goes direct to the Government of India.

25278. That also goes to the Government of India?—The duty on lac is a forest head of revenue and I think it goes to the Government of India. I am not sure.

25279. *Mr. Kamat*: Lac duty is Imperial revenue?—Yes.

25280. *Sir Henry Lawrence*: What is the amount of duty on tea paid by the Assam Government?—From 50 to 60 lakhs of rupees.

25281. *Mr. Hazlett*: You are aware, I think, that a commercial company was established two or three years ago to carry on lac cultivation on a commercial scale and that it has failed?—Yes.

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25282. Can you give us any definite reasons why this experiment has failed?—The principal reason is that the price of lac has gone down as the demand for the commodity has been reduced. There is less demand for lac now. Again the Assam lac is not fit for shellac. It used to be largely used in the manufacture of gramophone records as far as I know and now there is a decreased demand for gramophone records on account of the advent of the listening in apparatus.

25283. I think you asked for a Forest Officer to help you?—Yes.

25284. You do not get any help from the Forest Department?—No.

25285. And your staff could not take up the work and so nothing has been done?—That is the position.

25286. Lac is chiefly grown in the Mikir Hills I understand?—Yes, and the lower portion of the Khasi Hills.

25287. They are all having a bad time this year on account of the slump in price?—Yes.

25288. I see the Rev. Nichols-Roy estimates that 4 lakhs of maunds of potatoes were exported from the Khasi Hills this year; I think the actual figures were, three lakhs went down by motor lorry, and he estimates that another lakh went down by cart. He makes a general complaint that owing to the high rates charged by the motor company the development of the industry in this district is being hampered. There is a definite season for potatoes here. What was the price of potatoes during the season?—During the season it was between Rs. 4 and Rs. 5 a maund.

25289. But now the price has gone down to about Rs. 1-8-0 a maund?—Rs. 1-8-0 or Rs. 1-12-0 a maund.

25290. That is because the potatoes have missed the market?—Yes, there is now less demand in Calcutta.

25291. Other markets are supplying the demand?—Yes.

25292. Our market here is in August, September and October?—Yes.

25293. Then the Burma potatoes come in; unless the Shillong potatoes get down by the end of October they will not pay?—The Assam Valley potatoes are also coming in now.

25294. That is the local demand?—Yes.

25295. That is one reason why the Rev. Nichols-Roy says the actual freight on potatoes down to Gauhati is now more than the price in Shillong?—Yes.

25296. But that refers only to the slack season?—Yes, but I should think the advent of mechanical transport has increased the production of potatoes in the Khasi Hills.

25297. Yes, that is the general opinion, I think. As regards manure, I see you are using water-hyacinth ash in Sylhet for potatoes and jute?—Yes.

25298. You know the water-hyacinth is spreading all over the Sylhet district; every little puddle, tank or stream is covered over with water-hyacinth?—Yes.

25299. Do you not think use might be made of this as a manure, either by digging it in or burning it and so obtaining the valuable potash which it contains; the cultivators have next to their own fields a very valuable manure?—It could be used; as a matter of fact, we have been demonstrating the use of the water-hyacinth as a manure to many cultivators, but it has not been taken up; I do not know why.

25300. It seems to be possible, does it not?—It is a possibility, of course.

25301. So that it could be used for manure instead of being a pest as it is at present. It fills up the waterways, though it does good by filling up the low country by collecting silt?—It is not considered a very good manure.

25302. That is a matter for investigation, but it seems that more use might be made of it. My friend Rai Bahadur Ramani Mohan Das complained about the floods in Sylhet and wanted more irrigation channels, sluice gates and that sort of thing. It is a fact that Sylhet is surrounded by the rainiest tracts of country in the world?—Yes.

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25303. And it is a very low-lying tract with very little outlet?—Very little fall.

25304. I think the town of Sylhet is 40 feet above sea level?—Yes.

25305. So that the question of drainage is a very difficult one?—Very difficult.

25306. The problem of prevention of floods in Sylhet and the Surma Valley generally is also a very difficult one for that reason. Are you of opinion that anything practical could be done?—I cannot suggest anything definite, unless an engineer is deputed to study the whole question; it is a very difficult question.

25307. You have read the report of about 1916 of the Chief Engineer, Mr. Oertel?—Yes.

25308. With regard to animal husbandry, we have in Assam semi-wild animals, such as the *mithan* which is I believe an ox?—Yes.

25309. And the Assam buffalo?—Yes.

25310. Do you not think more use could be made of the *mithan* and the buffalo in developing new breeds of animals for this Province?—Yes; a separate buffalo farm is required in a convenient locality where crosses might be made between the wild buffaloes and local buffaloes.

25311. Do you not think it would be desirable to take special measures to preserve the Assam buffalo?—It is very desirable.

25312. He is a very fine animal from the bone point of view and the female is a good milker?—Yes.

The Chairman : Do they remain in a wild state?

25313. *Mr. Heslett* : The wild bulls come in from the forest and cover the tame cows; that has kept up the standard of the breed to a great extent?—In doing so they are liable to contract rinderpest and die.

25314. That is a matter which will have to be dealt with by the Veterinary Department. Could you produce a good specimen of the Assam buffalo for the Members of the Commission to see?—Yes, at Jorhat.

25315. *The Chairman* : What colour is the skin?—Usually black.

25316. *Mr. Heslett* : Of course, there is the other type of buffalo, the Bihar and Orissa type?—Yes.

25317. He is an inferior beast altogether?—Yes, he is quite inferior to the half bred; the half bred is called the *dhumassa*; that also is a good animal.

25318. You think we should develop the buffalo?—Yes.

25319. As being more suitable to the climate of Assam possibly than the cow or the ox?—I think we ought to have a buffalo farm.

25320. Then with regard to the *mithan*?—The *mithan* was tried in Upper Shillong farm I think some time ago; it is good for bone but not for milk.

25321. It is not a good milker?—No.

25322. But for ordinary draught purposes it is a very fine animal?—Yes. It is suitable for the hills, not for the plains.

25323. You do not think it would live in the plains?—No.

25324. It might be possible to produce a cross between the *mithan* and the cow which would be a useful animal?—Yes.

25325. With regard to fruit, in this Province, do you not think we have done rather too much towards growing apples and pears and that sort of fruit and not done enough on the growing of stone fruit?—I agree with you there.

25326. Do you not think plums, apricots and peaches do well in the Khasi Hills?—They do.

25327. They are more or less indigenous?—We have first to work with the indigenous fruits like oranges.

25328. Oranges are the chief fruit, I agree, but instead of apples and pears, I think we should go in for stone fruit such as plums, which do very well here?—Yes.

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25329. And apricots and peaches which can be grown very well here?—Yes.

It would be better to devote our energies to stone fruit than to such fruits as apples and pears as the place is possibly not cold enough for them.

25330. Have you any special theories about agricultural education?—I have already said that we must make some sort of a beginning, at least in the middle schools.

25331. You think we should start in the middle schools and have some sort of vocational middle school?—Yes.

25332. To teach agriculture, industry and the literary side as well?—Yes. Of course, there we are also held up by want of funds.

25333. *Sir Thomas Middleton*: You told me some time back that the quantity of seed potatoes which you had to distribute was sufficient only for a very small fraction of the area grown in the Khasi Hills?—Yes.

25334. Do you select the men to whom these seed potatoes go?—We select the men from whom we get these seed potatoes.

25335. My question was, do you select the men to whom you sell or supply seed potatoes?—No, we do not select; we sell seed potatoes to those who want them.

25336. You supply those who will buy them?—Yes.

25337. So that you cannot say whether your selected seed falls into the hands of careful growers?—No, that, of course, we cannot say.

25338. Is the potato trade of the Khasi Hills mainly a seed trade or mainly for food?—Both for seed and for consumption.

25339. Can you give us any indication of the relative importance of the two?—I think for consumption it is about three-quarters and for seed about one-quarter; that is my impression.

25340. You told us that the price at the beginning of the season was Rs. 4 to Rs. 5 per maund?—Yes.

25341. Was that for food or for seed?—For food.

25342. Which fetches the highest price?—The bigger potatoes which are used for food fetch a higher price.

25343. But does not the immune selected seed which you send out command a higher price?—They do not go to the market at all. The ordinary cultivators also sell seed potatoes to the Marwaris; the Marwaris take them down to the plains and sell them as seed potatoes. We give out seed potatoes to selected cultivators, get the whole crop of seed potatoes from them, and then distribute them.

25344. I follow that, but you grow and distribute about 2,500 maunds?—Yes.

25345. And you sell them to any purchaser of seed?—Yes.

25346. Can you say whether these potatoes command any higher prices than the ordinary potatoes of the country when they are grown by the cultivators?—No, there is no such distinction as to price, I think.

25347. *Mr. Hazzlett*: Is there a bigger yield?—Our seed potatoes germinate better and they probably get a better yield; that is why they pay us a little higher price than they pay to the ordinary traders.

25348. *Sir Thomas Middleton*: I can understand the cultivator buying from you at a slightly higher price in order to get selected potatoes?—Yes.

25349. I want to know whether the people to whom he sells recognise that his potatoes have been selected and are worth a higher price?—I think not.

25350. Is the practice of *jhuming* very common on the Khasi Hills?—In the Khasi Hills, the terraced cultivation has spread and *jhuming* is practised on only a small scale now.

25351. It seemed to me common in the neighbourhood of Shillong?—It is cultivated in parts.

25352. I was referring to the cutting of the forests?—They are cutting of course to clear the land.

25353. Is it a common practice to cut and clear before growing potatoes?—Yes.

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25351. They grow potatoes for how many years?—For three or four years.

25355. Then what happens?—They leave the soil and allow it to recuperate.

25356. As regards statistics, you tell us that you have accurate figures for six temporarily settled districts?—Yes.

25357. But you have no accurate figures for the Hill districts or for the two permanently settled districts of Goalpara and Sylhet. Are these two districts important rice-growing areas?—They are very important.

25358. How do you manage to estimate the acreage under rice in these districts?—It is purely guess work.

25359. I see in 1923 you reported to the Government of India that you had 4,596,197 acres under rice in Assam. When you guessed the acreage in these two important districts, I do not see how you came to specify "107"?—We got accurate figures from the other districts although from these two districts we might have had only round figures.

25360. Are there any considerable areas in any of these two districts which are not permanently settled?—They are all permanently settled.

25361. So that you cannot proceed by taking samples of the districts?—It has not been tried. In those two districts, they have got *chowkidari* panchayats.

25362. In this figure of 4,596,197 acres under rice, how much would you put in as a guess of the acreage in those two areas?—Sylhet, 1,787,000 acres; Goalpara, 420,000 acres.

25363. That is, nearly 50 per cent of the area reported on is really based on a guess?—Yes.

25364. And you have no means of checking that guess at all?—There are no means of checking it.

25365. How do you fix on the figure at 1 million rather than 500,000?—That is reported by the Deputy Commissioner.

25366. There is, I suppose, a survey and the total area is known?—Yes.

25367. And the guess is that rice occupies a certain percentage of the total area; is that the method?—I think that is the method.

25368. Then the same difficulty arises in the case of your livestock statistics?—No. Livestock is counted head by head.

25369. In these two districts also?—Yes.

25370. By what officer?—By the *chowkidari* panchayats.

25371. *Mr. Hazlett*: You said that the whole of the districts of Goalpara and Sylhet is permanently settled. That is not quite correct?—No, the whole of the Jaintia Parganas has to be excluded.

25372. And other parts of Goalpara. The whole district is not permanently settled?—No.

25373. In those temporarily settled areas of Sylhet and Goalpara do we get accurate figures?—Yes.

25374. So that you have some check over the reports of *chowkidars*?—By comparison with temporarily settled areas we can check them to some extent.

25375. *Sir Thomas Middleton*: That is the point I wanted to get at. You have got sample areas?

Mr. Hazlett: We have some areas for which we get accurate figures, but they are not typical.

25376. *Sir Thomas Middleton*: Yet they help the District Officers in making a reasonable guess?—Yes.

25377. *Sir Henry Lawrence*: Is there a cadastral survey?—Not in the permanently settled areas.

Mr. Hazlett: In the temporarily settled areas we have settlements every twenty or thirty years. A resettlement is going on now.

25378. *Sir Thomas Middleton*: Would it not be desirable that some warning should be given of the fact that these very important figures are largely estimates?—They are much more valuable than those for the Bengal districts. They are under the same difficulty in Bengal.

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25370. *Prof. Gangulee*: Has the Development Board at any time discussed the question of finding funds for the Agricultural Department?—The Development Board had only one sitting.

25380. Since its formation?—Yes.

25381. The matter has not been taken up?—They have suggested many improvements, but they require money to be carried out. For instance, they have suggested demonstration farms in each sub-division.

25382. They have suggested a programme, but have they not suggested any means to get the extra funds?—No.

25383. What is the attitude of the local bodies towards agricultural development, especially with reference to cattle-breeding?—In some places the Municipalities and Local Boards maintain bulls, but not in all places.

25384. They have an income from cattle-pounds?—They have.

25385. To what extent?—The whole of the pound income is made over to the Local Boards.

25386. Do you think it is about one lakh?—I could not tell you the figure. The Municipalities have their own pounds.

25387. They do not earmark that particular income for cattle improvement?—No.

25388. There are no farms in this Province run by educated or middle-class men?—Yes, there are.

25389. Are there large numbers of them?—They have come into existence only recently.

25390. What is the average area they have?—There is a farm of about 300 acres in Atharikhat in Darrang district.

25391. Run by *bhadralog*?—The largest farm is of 300 acres; it has got three tractors besides other implements. They also run a poultry-farm.

25392. Do they go in for commercial farming?—Yes, for jute, sugarcane and mustard.

25393. *The Chairman*: Have you a great variety of weights and measures in use in the Province?—We have the same weights and measures throughout the whole of the Province.

25394. Would you be in favour of any attempt to standardise weights and measures?—I think the same weights and measures are in use in the whole of this Province. Probably there cannot be a standard for the whole of India.

25395. Would you favour that?—I would not.

25396. You think there cannot be a standard?—There cannot be the same weights and measures for the whole of India.

25397. Why do you form the view that there could not be the same weights and measures for the whole of India?—Practically the same weights and measures prevail all over Assam; there may be other weights and measures in India which may not be understood in Assam.

Prof. Gangulee: A committee was appointed by the Government of India to consider this question.

25398. *The Chairman*: Within the borders of this Province, have you a great variety of weights and measures?—No.

25399. Do you find that tribes inhabiting neighbouring valleys understand and use the same weights and measures?—They generally use the weights and measures in use in the plains.

25400. Are the local authorities in the Province empowered to allocate any revenue towards advancing the co-operative movement?—No. The local bodies do not allocate any part of their income. I think they are not allowed.

25401. Have you anything which you wish to say as to the local authorities and the powers which they have in matters touching agriculture, and the extent to which they use those powers?—I may say that cattle-breeding is a subject in which they are allowed to spend part of their money. But

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with regard to other forms of agriculture, say farms, I do not think they can spend anything.

25402. But you have no criticism or constructive suggestion to put forth in that direction; is that so?—I have made some suggestions with regard to agricultural education.

25403. Nothing else?—There is nothing else which the local bodies can now do.

25404. The Dewan of the Gauripur Raj, Mr. Chakravarty, has put something in his note of evidence, which I think you will like to hear and possibly answer. He is talking about demonstration and propaganda, and he talks of one incident which occurred two years ago after a severe flood in some parts of the Estate, "I asked the Agricultural Department for a large quantity of paddy seeds for loan to tenants, to enable them to try a new crop in places where the existing crops had been destroyed by floods. The seeds were supplied and paid for by this Estate and distributed amongst the ryots. In many areas the seeds did not germinate but the Agricultural Department did not refund the price which had to be borne by this Estate. The result is that the ryots lose confidence in seeds supplied by the Agricultural Department and it will now take years to restore the confidence thus lost. This is of course due to the department having no seed stores"?—I think I know of that incident. Probably the failure was due to their trying to grow it too late. They did not try to grow it in proper time. That was what was brought out in the enquiry.

25405. There was an enquiry?—Yes.

25406. What sort of enquiry?—The Deputy Director enquired into it, and it was found that the seeds came too late for sowing. There was delay, of course, in securing the seed.

25407. Who was responsible for the delay, your department or the persons asking for the seed?—They asked for the seed late, and at the same time there was delay in our supplying the seed, because we had to get it from the Sylhet district in the Surma Valley.

25408. I take it you wish you had told them that it was too late in the year for that particular seed?—I wish we had told them that they made up their mind too late to start.

25409. *Sir Henry Laurence*: Why could they not get the seed themselves?—That kind of seed was not available in their district. It was a kind of paddy which was grown only in the Surma Valley; they asked for it and we had to get it from the Surma Valley.

25410. Where would you say most of your problems lie, in the plains districts or in the hills?—In the plains, not in the hills.

25411. You think this is the right place to have your centre?—This is the headquarters of the Government; I must be here. In financial and other matters I have constantly to refer to Government. I am under the Minister, the Minister is here, and in every matter I have to take his orders.

25412. No doubt you are required to be here as Director. Has there been any proposal to start any experimental farms in the plains?—We have already got experimental farms in the plains.

25413. For particular crops?—Yes.

25414. That, you think, meets the needs of the position?—Yes, and our agricultural laboratory is also in the plains.

25415. Take your Botanist; where is he working?—In the laboratory at Jorhat.

25416. Would you suggest that any addition to your scientific staff should go down to the plains and work there?—I have suggested all the additional staff.

25417. Would you suggest that they should go down to the plains and work there, or would you have a larger staff in the hills?—All of them are in the plains; there is no large staff here.

25418. *Rai Bahadur R. M. Das*: Where is the headquarters of your Deputy Director?—It is at Jorhat.

25419. Where did Mr. Chakravarty live?—He lived in Jorhat, his headquarters.

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25120. Does your Deputy Director spend most of his time here?—He has to come here sometimes; there is a farm here, but he had his headquarters in the plains.

25121. Mr. Hestell: You are aware that Government did try to establish a regular measure for paddy called the *don*?—Yes.

25122. They did try to establish this measure all over the Province as the measure for paddy, but it was not a success, it did not take on?—Nowadays paddy is sold by weight.

25123. Not by basket?—It used to be sold in small quantities, and even now it is sold in small quantities by basket measure, the *don*; but when traders like Marwaris purchase it, they do so by maunds and seers.

25124. The Marwaris purchase it by maunds and seers and not by baskets?—Yes.

(The witness withdraw.)

Srijut LAKSHESWAR BARTHAKUR, In-charge Deputy Director of Agriculture, Assam.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) So far as Assam is concerned, research has not made much progress. Moreover, what work had been done in the line was not commensurate with the expenditure incurred as a good deal of it was either of negative nature or not suited to the real needs of the cultivator or to his mentality. It appears to me that a regular survey of the local and provincial problems on all agricultural matters should have been properly made and their relative value and importance estimated and the prospects of their solution carefully weighed and a plan of work settled. As this was not done, we have had several failures and several projects have had to be abandoned.

The question of research into the scientific value of the indigenous theory and traditional methods of agriculture has not been taken up seriously in this Province.

(b) Progress is not being made both for lack of resources and deficient organisation and for want of sufficient and suitable skilled workers. It appears to me that the experts also should have the local experience to be acquainted with the mentality and the real needs of the cultivator and have sympathy for him to know under what difficulties he is to live and work.

(c) The following problems appear to deserve inquiry into:—

(i) Rice:—

(1) Milling and table quality of the rice varieties selected for improvement.

(2) Feeding value of their straw as cattle food.

(3) Value of tillering against heavy heads of ears of paddy.

(4) Study of the flora of the rice field in its relation to soil fertility, acidity, etc., and the best means and methods to kill them.

(5) Studies of the water requirement.

(6) Studies as to how seeds from a colder climate and from a richer or heavier soil behave in warmer climate and on poorer soil or *vice versa*.

(ii) Oil-seeds, pulses, and fibre crops:—Practically nothing has been done with regard to these crops.

(iii) The best method of conserving cattle manure.

(iv) Studies to find out a suitable rotation for the typical paddy tracts.

(v) Improvement in the design and construction of the common implements so as to increase their efficiency.

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(vi) Plant diseases:—

- (1) Potato blight.
- (2) The betel-nut palm disease.
- (3) The orange diseases.

- (vii) Practical campaign against insect pests—such as the use of the Andro Mairo Traps.
- (viii) Intensive studies and investigation into the diseases and pests of the potato crop in the Khasi Hills, which in spite of extensive ravages of the potato blight annually exports 200,000 to 400,000 maunds of potatoes of which a considerable portion is used for seed in Assam and the neighbouring districts of Bengal.
- (ix) Establishment of seed and demonstration farms in suitable localities, preferably one in each sub-division.
- (x) Establishment of a few model farms to take up the problems connected with economic farming for middle class men (including poultry, bee-keeping, pisciculture, sericulture, etc., as subsidiary industries). This would serve as an incentive for adopting improvements in agriculture by the ordinary cultivators also.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) to (vii) I have no experience of any agricultural institution as we have done practically nothing for teaching agriculture academically. The only work done in this line is the training of apprentices for our demonstrators and educating the cultivator through practical demonstrations in his own fields.

It appears to me that, as agriculture is the sole occupation of 85 to 90 per cent of our people, agricultural education could not be neglected. This should be the greatest concern after literacy has been provided for by means of free primary education. But unfortunately, under the existing circumstances, a boy would be sent to a school only with the idea of securing employment for him, preferably in Government service, and everybody even of the cultivating class, thinks that the people know all about agriculture and they have nothing to learn.

It is true that the successful cultivator does his work timely and most of it rightly. But if he had understood the scientific principles underlying all cultural operations and known 'why' as well as 'how' to do he would surely have done much better. But there are larger number of cultivators who are not as successful as the best ones and their ignorance is mainly responsible for the poor result they get. Moreover training with the cultivators who are themselves ignorant would necessarily take a long time and yield the worst results. This could and should be remedied by establishing agricultural schools in rural areas and ultimately agriculturalising the secondary education for the rural mass.

For a beginning, I would suggest that a number of middle English schools should be converted into agricultural schools by modifying the curriculum in the upper three classes and introducing therein both theoretical and practical agriculture with a suitable farm attached to each. The school farms could perhaps be worked by the agricultural students and the produce would help them to meet a part of their expenses.

Such schools, if at all established, could very well be combined with the seed and demonstration farms proposed by the Agricultural Department and they would be financed and managed by the Agricultural Department.

(viii) Nature study has its own value but in a country like Assam it is not necessary to lay too much importance to it.

School farms are out of the question unless the school is an agricultural one.

School plots are seldom looked upon as a field for object lesson. As the pupils live away from the school and as they have no personal interest in the work, it appears dull and uninteresting to them.

Under the existing economic and agricultural conditions, I think home gardening of flowers and vegetables would be highly appreciated both by the pupils and their guardians. So this should be encouraged by all means, such as by supplying free seeds, free manure (where necessary) and use

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of necessary implements as well as by offering prizes and holding shows in the school premises for the flowers and vegetables grown by the pupils. These shows may very well be combined with other school festivities such as sport and prize distribution ceremony.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) Practical demonstrations in the midst of villagers combined with timely propaganda have been found to influence the practice of cultivators.

(b) Placards on the fields where demonstrations had been successful and propaganda to bring their results home to the cultivators by holding meetings in the locality should increase the effectiveness of the field demonstrations.

(c) The best way to induce the cultivators to adopt expert advice would be to present it in an attractive way which could be done only by (1) approaching them through the local influential people and middle class farmers, and (2) proper advertisement either through circulation of suitable literature or any other means.

(d) Instances of success:—

- (1) Success of improved jute and paddy seeds in the Surma Valley and in many parts of Assam Valley.
- (2) Success of the improved sugarcane varieties in localities in Assam Valley where there is no danger by jackals.
- (3) Success of bonemeal on paddy in the Khasi and Jaintia Hills.
- (4) Introduction of Shillong potato in many localities where potato was not grown before.

Instances of failure:—

- (1) Failure of the improved sugarcane from damages by jackals.
- (2) Failure of cowpea as green manure for sugarcane.
- (3) Failure of the improved paddies, selected in Karimganj farm in Upper Assam.
- (4) Failure of bonemeal manuring on paddy to become popular although it was not economically unsuccessful.

QUESTION 4.—ADMINISTRATION.—(a) & (b) Unlike the richer Provinces like Bombay and Madras, Assam could not afford to be self-contained in the matter of research and technical knowledge. There would, therefore, be decided advantages if services of experts like Phytopathologist, Soil Mycologist, Agricultural Engineer, etc., could be borrowed from the Central Department for definite periods. But the subordinate staff should preferably be provided by the Local Government.

In cases where services of experts are thus lent they should be allowed to work under the Local Government in all matters except in that of co-ordination of the technical matters with that of the Central Department.

(c) (i) The Veterinary Department's services are inadequate and the Agricultural Department's are still more so. Staff should be increased and adequate funds provided.

Moreover, measures should be taken to make these services more popular.

(ii) Railway, steam and motor services, etc.

The interests of the agricultural people do not appear to have received due consideration at the hands of the carrying companies. The following may be mentioned for special consideration:—

- (1) The interests of the Khasi potato growers.
- (2) The cattle traffic from Bihar into Assam:—
Reduction in fares and expeditious transit and betterment of the wagons used (at present only C.I. wagons are being used) would be of much benefit to the trade.
- (3) The special (low) rates prescribed for certain goods and between certain stations should be liberally extended so as to enable transport facilities for all agricultural products and in all places.
- (4) Breeding bulls should be carried at specially low rates of fares.
- (5) Facilities for the carriage of fruits, vegetables and perishable agricultural products should be increased.
- (6) All plants and grafts, etc., should be allowed lower rates than at present.

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(iii) Roads—

In the matter of roads also the interests of the cultivators do not appear to be properly looked after because they do not know how to raise any organised voice.

Perhaps the nomination of the agricultural officers to local bodies may be of some use to this matter.

(iv), (v) & (vi) The agricultural progress of this Province has not reached such a stage as to requisition the services of the Meteorological Department, Posts, Telegraphs and Wireless for direct agricultural purpose.

Timely information as to great storms, etc., and forecasts of weather will no doubt be of considerable use if properly notified.

Perhaps, supply of information as to the current market rates and their tendency in respect of important staples for sale, e.g., jute, paddy, cotton, lac, potato, may be of some use in giving moral support to the producers in the disposal of their goods.

Publicity to the above may be given by issuing weekly bulletins notified in public places, such as railway stations, post offices, *thanas*, school houses, *kutcheries*, etc.

QUESTION 5.—FINANCE.—(a) (1) The activities of the co-operative societies should be extended.

(2) Establishment of land mortgage banks should be encouraged.

(3) The scope of the Agriculturists' Loans Act and Land Improvement Act should be extended and adapted to the cultivators' needs.

(b) *Taccavi* loans are unpopular for the following reasons:—

(1) They are usually too inadequate to meet the cultivators' needs.

(2) Very often they are granted only on the joint responsibility of several persons.

(3) At the time of realisation there is much unavoidable hardship caused to the debtors.

To make *taccavi* loans popular there should be provision for adequately helping the needy but solvent and for discrimination in administering the loans.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) The cultivators have to contract indebtedness in order to clear off old debts, to defray expenses of social and religious obligations and ceremonies, to purchase land and property and to meet expenditure necessary for maintenance.

(ii) Local moneylenders who are either (1) local people or (2) Marwari *mahajans*.

(iii) Very often the debts are contracted at exorbitant rates of interest, far above the paying capacity of the borrower. Sometimes unfortunate and unforeseen mishaps, such as failure of crops, mortality of cattle or long illness in the family of the cultivator, occur and sometimes on account of spend-thrift habits of the cultivator repayment becomes difficult.

(b) Usurious interest should be prevented and attempts to circumvent the same should be efficiently tackled. Facilities for redemption of mortgages are likely to be of use.

(c) It would perhaps be desirable to restrict sale so as to prevent land passing off to non-agriculturists or non-domiciles. Non-terminable mortgages also should be prohibited.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—This is an All-India problem and a problem mainly for the Legislature, I believe. The evils from this cause are not yet so much felt in Assam but they have begun to appear in certain congested localities. It would be wise to consider it as an important problem for the future.

QUESTION 8.—IRRIGATION.—Irrigation in the modern sense of the word is not of any general importance in Assam. But there is an indigenous system of irrigation which is widely practised in the wet paddy cultivation in the hills and in some parts of Goalpara, Kamrup, Darrang and Sib-sagar where with the help of temporary *kutcha* dams in upper regions and

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drains and raised embankments, water is carried, sometimes over long distances, and paddy fields are irrigated. There are about 200,000 acres of land mainly under paddy in Assam, irrigated by this system.

No technical advice not even supervision and very rarely financial help has been rendered to the cultivators. Something should be done to help them.

QUESTION 9.—SOUTH.—(a) (i) Drainage is necessary near about village sites where all high-land crops are usually grown. But for want of measures on a sufficiently large scale many localities suffer both from bad sanitation and difficulties in high-land cultivation.

(ii) Reclamation of alkali lands does not arise in Assam.

(iii) The evil effect of soil erosion due either to flood or rain water is not felt much in the plains. But it is very severe in the hills. Terracing and embankments are tried with good results.

(b) Cases of soil improvement in low-lying tracts through silt deposit are occasionally met with. On the other hand, many a good paddy field has been spoiled by road drains passing through it.

(c) There are considerable cultivable areas lying waste in Assam. Government should encourage farming on a large scale by granting leases to middle-class men on favourable terms and also by granting land improvement loans on an extensive scale.

Perhaps ranching of cattle will be of double benefit both by improving cattle and by bringing land under use.

As to the reclamation of areas gone out of cultivation, they should be either converted into suitable pastures for the benefit of cattle improvement or brought under cultivation by better cultivation and manuring.

QUESTION 10.—FERTILISERS.—(a) For paddy cultivation, which is the main staple crop of the Province, fertilisers are not likely to play any part for some time yet to come. This is mainly due to the fact that most of the paddy fields are self-fertilised by washing from village sites or by flood water and also to the fact that fresh areas are being brought under paddy cultivation.

But in growing sugarcane, fruits and vegetables concentrated manure-like oil-cake are more or less freely used and the use of artificial manures is likely to spread gradually. For this purpose, there should be propaganda work and measures to remove the apathy of the cultivator as well as his chronic lack of cash.

As to the application and use of natural manures, there appears to be an immense field for educating the cultivators in the matter of conservation of cattle manure and its use. Assam stands apart in this matter from other Provinces as the use of cowdung for fuel is practically unknown to the indigenous people. The number of cattle per capita is also pretty high in Assam and the total production of cattle manure is consequently large. But very little of this is used by direct application. I would estimate that only 10 to 15 per cent of the total cattle manure produced is utilised, the balance being either washed away or wasted. If all the cattle manure, household refuse including ash, etc., and the vegetable refuse of the homestead were collected under a compost shed in each household, there would be enough manure to push on agricultural improvement to a very large extent. Estimating at five heads of cattle and five persons per household of the cultivating class, the average production of this compost manure of a cultivator's family would be at least 300 maunds per annum. Proper utilisation of this quantity of natural manure should produce an increased crop producing a net profit yield of at least Rs. 100. Thus the enormous cattle manure and compost manure wealth of the Province, 80 per cent of which is now unconsciously thrown away, would amount to a large sum. Thus it would appear that the field for work in educating the agricultural public in their conservation is very wide and any activity, if carried on in an adequately intensive scale, would yield important results.

(c) Since 1915 till recently we paid a good deal of importance to demonstrations with bonemeal, flour phosphate on paddy but although the results were not economically unprofitable they failed to be popular with the cultivators except in the Khasi and Jaintia Hills, where bonemeal has become quite popular owing to their inability to get any decent crop without bonemeal.

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The main causes of failure of phosphatic manures in attaining popularity in the plains are the following:—

(1) The apathy of the people, no doubt due to want of keen struggle for existence, to anything that is short of an extraordinary or miraculous nature.

(2) Lack of funds and inability to finance as well as want of purchasing facilities.

(3) Their costly nature at least in the first cost.

The usefulness of other artificial manures has not been sufficiently investigated.

(b), (c), (d) & (f) These points either do not arise or are not of much importance for Assam.

The foregoing remarks apply only for ordinary cultivation. But in the case of special cultivation, like tea, artificial manures play an important part and are properly appreciated and used. In this Province, there are some 900 tea gardens with 400,000 acres under tea and enormous quantities of artificial manures are consumed.

QUESTION 11.—CROPS.—(a) (i) The problem of improving paddy, sugarcane and potatoes has been already taken up by the Agriculture Department. Only the staff has got to be increased and experiments on other crops such as oil-seeds, fibres, pulses, aman paddy, etc., have to be taken up. For this purpose at least three more experiment stations are necessary.

Production of improved varieties is an important factor in the improvement of agriculture as it is easy to appeal to the cultivator through improved seed because it does not cost much to try it.

(ii) Introduction of new crops also are quickly appreciated by the cultivator, if it is successful and pays them to adopt the same.

(iii) As a rule, cultivators are accustomed to grow their own seeds of the staple crops. So they would rather get a small supply of the improved seeds free and propagate them themselves than purchase their requirements. This fact must be duly considered in any seed distribution.

(iv) Wild animals, e.g., pigs, monkeys, rats, squirrels, hares, deer, elephants and various birds cause lots of damage to all sorts of crops wherever they can. And Assam being a country full of jungles, a considerable area is exposed to their depredations.

To afford help to the cultivators in protecting their crops, adequate provision should be made for granting gun licenses more freely for this purpose. Wherever we agricultural officers go, we receive applications for help in securing gun licenses. If Government are unable to grant an adequately large number of permanent licenses, arrangements may be made for hiring out Government arms for short terms with temporary licenses.

(b) The prospects of maize as a rainy season crop on high land and wheat and barley in the cold weather have not been properly investigated in this Province. I think this should be done.

(c) The improved varieties of sugarcane, jute and paddy are nowadays extensively grown. The Shillong potato has been introduced in many a locality in Assam where it was not known before and has replaced many less paying local crops. The cultivation of European vegetables also has extended largely through the activities of the Government seed depot.

QUESTION 12.—CULTIVATION.—(i) There is scarcely any room for improvement in the existing systems of tillage unless through improved implements and improved draught animals.

(ii) Rotation of crops in the true sense of the word is practically unknown in Assam. Fallowing is sometimes practised generally to give rest to the soil. Owing to the two strikingly different kinds of cultivation—namely, rainy season for the wet paddy on low lands and the dry cold season for the *rabi* crops on high and well aerated land—it is difficult to make a really valuable suggestion. However, the following may be suggested where practicable:—

1. Jute and potato.

2. Maize and *matikalai* or cowpea.

3. Early jute and late *aus*.

4. *Aus* and *sail* paddy.

5. Sugarcane (plant and ratoon) and *arhar*.

6. Sugarcane, plant and ratoon, cowpea and mustard (green manure).

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QUESTION 14.—IMPLEMENTS.—(a) Although all the implements ordinarily used by the Indian ryot are simple and crudely made, there appears to be some room for improvement in their making. Proper investigation has got to be made into the matter before any suggestions could be made.

Introduction of new implements has got to be made very cautiously. Unless the same are tested as to their suitability to the real needs of the cultivators, good results are not likely to be obtained. This must be done in the Government farms and by the demonstration staff.

(b) Before the cultivator can adopt improved implements, there must be improvement of draught animal and improved financial facilities as almost invariably improved implements require higher costs and greater draught power. But in case of very inexpensive and small improved implements, mere demonstration and propaganda will do.

(c) Manufacturers are seldom acquainted with real requirements of the Indian cultivator. For this purpose their technical experts must come to the field and study local conditions. It is extremely doubtful whether manufacturers in Europe could cater for the ordinary requirements of the mass cultivators as they require very simple and inexpensive implements because no skilled artisans are available to work and repair them in rural areas. Moreover, their resources are very limited.

QUESTION 15.—VETERINARY.—(a) I think the research portion of the Veterinary Service should be under the Central Government, but the ordinary treatment of sick animals as well as the campaign against epidemics should be placed under the Director of Agriculture.

(d) There should be permissive legislation empowering the execution to deal with contagious diseases where and when necessity occurs.

QUESTION 16.—ANIMAL HUSBANDRY.—I have dealt with this subject in my Report on Cattle in Assam.

There is a strong contrast between the powerful and heavily-built Assamese buffaloes and the stunted and miserable looking cattle in Assam. The former is superior not only as a draught animal but is also a heavy milker.

The obvious conclusion would be that the soil and climate are naturally adapted rather to the buffalo than to the cow. This question has not received any attention till now and requires to be properly investigated.

(a) (i) So far as Assam is concerned, one thing appears to me to be by far the most important. It is the prevention of gradual degeneration through inattention to the breeding principle.

In Assam, there is no breeding bull maintained in any system. Stall-feeding is unknown. Cattle are let loose for the greater part of the year. Generally speaking, the bull calves of more robust make and growth are castrated early for the purpose of impressing them into services but the stunted, weedy and miserable looking young bull calves are left entire with the idea of having better looking bullocks when they are castrated later. Thus these weedy bull calves grow up and mate promiscuously in the common pastures and produce more and more degenerated progenies. In this way there is a considerable degeneration, generation by generation. Unless this is stopped, no appreciable progress can be achieved by any measure for cattle improvement.

For the above purpose, legislative measure as well as State help would be necessary as individual efforts would be of no avail even if there were genuine attempts at it. The following measures are likely to produce the desired effect. At least they may be worth trying in a district or two:—

- (1) Legislative measure—prohibiting castration of animals by unqualified and unlicensed men. This will be justified at least to prevent cruelty to animals.
- (2) Provision for suitably trained village castrators who should be required to work under licenses with rules and regulations and within limited areas. These castrators will be allowed only to use the Burdizzo method or similar methods which will prevent cruelty to animals. The condition of licenses would be that the castrators could not castrate the best few of the young bull calves which will be left entire to sire the village cows but after they have served for a year

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or two the same would be castrated by the Veterinary Assistant either freely or at the cost of local bodies. Of course, the services of the village castrator would be paid for by the owners of the castrated animal.

It would perhaps be better to so amend the Cattle Trespass Act as to explicitly provide that the income derived from fees and fines of cattle pounds be earmarked for the improvement of cattle.

(ii) Price of milk and other dairy products have gone up so much of late and adulteration of milk and *ghi* has become so common that serious attention has got to be paid both by the public and the State to the betterment of this industry. This question has become more acute in the towns where Municipalities should pay greater attention to the following:—

(1) Keeping of breeding bulls of milking strain to provide for service after castration has been controlled by the means suggested above or any other measure.

(2) Arrangement for growing green fodder, *c.g.*, Guinea grass or affording facilities for the same on municipal lands heavily fertilised by dumping street sweepings or night-soil.

(iii) In Assam, people keep many more cattle than they can properly look after and cause great damage to crops by letting cattle loose for the greater part of the year. This practice should be discouraged by active measures while encouragement should be given to the keeping of better classes of animal—

(1) By providing facilities for procuring cows of improved breeds from outside by intending purchasers.

(2) By propaganda work on the benefits of keeping better class of animals and on the art of cow-keeping.

(3) By holding local shows.

(b) (i) & (ii) In all the thickly-populated tracts there is overstocking of common pastures. Specially in the paddy-growing tracts the suffering of cattle knows no bounds during the months of July to November. In many a paddy tract the road sides form the only grazing area during these months and cattle suffer severely.

(iii) If people preserved all the available straw and stubble for feeding their cattle, it would have helped them very much in feeding their cattle. But in many places they sell the same on account of the temptation for ready cash or burn them for domestic purpose. But in many cases they do not realise the importance of straw and stubble and do not take the trouble to save them.

Active propaganda is necessary so as to impress the village people with the necessity and importance of saving of stubble and straw.

(iv) In the dry season, cattle suffer from absence of green growth on the high-land pastures. This could be particularly remedied by saving stubble and straw. I should think the system of feeding tree fodder as practised by the "Nepalee Khutiwallas" could be of great and extensive use. The following trees are likely to be of use in this respect; and it would be better if regular feeding experiments are carried on to determine their feeding value:—

Tree fodder.

(1) Simul—*Bombax malabaricum*.

(2) Sissoo—*Dalbergia sissoo*.

(3) Bipal—*Ficus religiosa*.

(4) Mulberry plant—*Morus species*.

(5) Shoanlu—*Tetrantheria monopetala*.

(6) Cassava—*Manihot utilisima*.

(v) In a Province of very heavy rainfall like Assam, the question of mineral constituent in fodder and feeding stuff seems to be of utmost importance. In the rainy season, cattle suffer very often from looseness of bowels and do not appear to keep as well as they do in the dry cold weather. All that we know from practical experience is that when salt is given cattle keep much better and eat with relish.

In addition to common salt, other kinds of mineral matters as well as phosphoric acid and sulphur compounds are likely to have great effect on cattle nutrition. This subject should afford a fruitful field for investigation.

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I should also think that the biological condition of soil as well as stagnation of water is likely to have considerable effect on the nutrition and health of cattle. This subject also should receive due attention from our scientists.

(c) The period of fodder shortage varies according to localities. In higher and drier tracts, it is during February and March, in low-lying tracts during July, August and September and again, in still deeper lying tracts, it is in the junctures of the dry and wet seasons, i.e., in May or June and in October. The fodder shortage lasts for only one to two months at a stretch.

(d) The cultivator must sooner or later take to cultivating fodder crops and he should be taught this by suitable propaganda work. The following steps are likely to produce important results:—

(1) To explore the tree fodder resources.

(2) To introduce silage making.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) If we divide the cultivators into three classes according to the keenness of their struggles for existence and on account of diversities of natural advantages, we would probably get the following figures showing the days of labour on agriculture proper:—

	In Assam Valley.	In Surma Valley.	In Hills.
1. Cultivators of the well-to-do or flourishing class who depend entirely on agriculture.	240	260	300
2. Cultivators as above but who have subsidiary industries to help them.	160	200	250
3. Cultivators who live a precarious life depending on agriculture alone.	150	180	200
4. Cultivators who live a precarious life and also work as labourers in spare time.	120	120	180

In the Assam Valley, almost every householder has got his homestead land on which he grows some fruits, economic plants such as betel-nut, betel-leaf, bamboo, etc., and vegetables. In many a locality, silk-rearing forms an important subsidiary occupation. The few heads of cattle and goats, etc., he keeps, also help him in either making his life comfortable or in earning some money. He does not spend any money on fuel and he devotes his short leisure hours, when he is not engaged in religious or social duties, in economic work connected with house-keeping.

In the Surma Valley also, the time of the cultivator is occupied in a similar manner except that there is no silk-rearing. In the hills, the life is much more hard as owing to the peculiar system of *jhuming* they have to get new lands cleared almost every year.

(b) & (c) Subsidiary industries may be of two kinds—one contributing to the comfort or improvement of the standard of living of the cultivator and the other yielding him cash return. For the former no special training need be provided but the latter may require proper training and careful development would be necessary. To improve the cultivator's living, he must have some such subsidiary industries as are suited to his tastes and aptitude as well as to the real necessities and possibilities obtaining under his local conditions.

In addition to the subsidiary industries already mentioned (bee-keeping, poultry-rearing, sericulture, pisciculture, lac culture, fruit growing), handicrafts and industries like handloom-weaving, carpentry, blacksmithy, wicker-work, bamboo and cane work, etc., deserve to be considered.

The following are the obstacles in the way of their expansion or adoption:—

- (1) Want of facilities for learning them.
- (2) Difficulties in obtaining the necessary tools and implements or seeds and materials; sometimes their costly nature.
- (3) Lack of facilities for marketing the finished produce.
- (4) Lack of finance.

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(d) Yes. Government should do more to establish and help these industries where there are prospects for them. Starch making from potato from the Khasi Hills, cultivation and manufacture of peppermint oil, either from oranges and other fruits, canning and packing of fruits, utilisation of the paddy husks produced in rice mills for fuel, etc., appear to deserve attention and consideration.

(e) Only industries connected directly with the preparation of raw materials to bring them to the marketable condition may flourish in rural areas, otherwise, generally speaking, local conditions in rural areas in Assam would not be suitable to the development of industrial concerns. It would perhaps not be desirable to industrialise rural areas which will greatly disturb the village life and bring in undesirable effects.

(f) Yes, by all means; but we should see that no undesirable industries are encouraged.

(g) & (h) Work of co-operative organisations and village authorities should be widely spread and intensively carried on so as to create a local body of workers for tackling these problems.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) If there were a Bureau for supplying necessary information and working as a medium for connection between the demand and supply of agricultural labour, some benefits might accrue to those who need them.

There should be a regular organisation to help people who want to migrate from a congested locality to a tract where suitable lands are available for settlement.

(b) The shortage of agricultural labour in the greater part of Assam is due to plenty of cultivable waste land where people can easily migrate.

(c) Opening of communication facilities in tracts of cultivable waste lands would greatly expedite the occupation and development of such areas.

QUESTION 19.—FORESTS.—(a) This is a question, I think, Forest Officers should be in a position to reply properly. As an agricultural officer, I would like to see more areas being thrown open for grazing. At least such forests as have not been worked properly or are not likely to yield much may be converted into grazing lands.

(b) Village grazing grounds and fuel reserves have been of considerable use to the cultivators. These are absolutely necessary under the existing practice of rural life. Wherever possible, increased reserves should be provided.

(c) Frequent *jhuming* for cultivation on hill sides leads to considerable soil erosion. To suppress this evil the system of cultivation of the hill people requires to be changed by discouraging *jhuming* and unnecessary firing of jungle.

(d) Afforestation is a costly affair and the natural forests, though not very valuable, are yet in existence on a large scale. Consequently protection of forest is of great importance in Assam. Moreover, the soil and climate of Assam are such that there is practically very little land without any vegetation. The only erosion, therefore, takes place on cultivated areas. So afforestation is not necessary in Assam for preventing soil erosion.

(f) Constantly grazed areas, whether forest or of grazing reserves, suffer serious deterioration through constant treading of cattle and impoverishment by removal of plant food. Matters may be improved by preventing overgrazing.

QUESTION 20.—MARKETING.—(a) The existing market facilities are far from satisfactory. Of the various kinds of agricultural produce that are of commercial importance, rice, *gur*, paddy, oil-seeds, *matikalai*, fruits (specially oranges), potato, cotton, jute and lac require mention. Out of these rice, *gur*, paddy, *matikalai* are consumed within the Province, only some paddy being exported out of the Province. The trade in these articles, as is the case with all sorts of trade in Assam, is in the hands of the Marwari traders, who care only for their own profits.

Potatoes form the most important item of export from the Khasi Hills. Its market in Shillong is entirely in the hand of Marwaris and is largely controlled by the demand in Calcutta and the transport facilities

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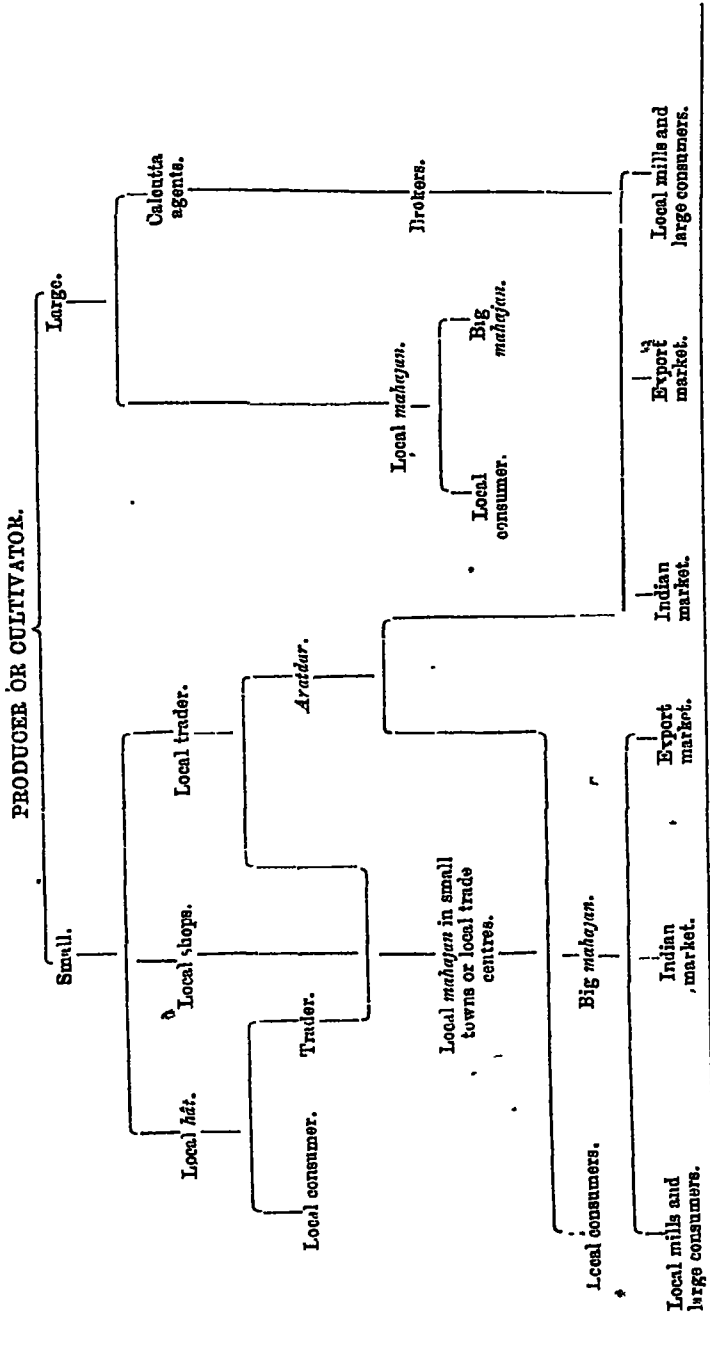
and motor freights. Besides, there are Khasi middlemen to bargain in the disposal by the actual growers. On the whole, the cultivators scarcely get the advantage of the actual market rates.

The market for cotton, jute and lac also is mainly in the hands of the Marwaris and small local traders and there are considerable speculations in these markets. But the producers get little benefit from the market fluctuations.

There appears to be very little that could be done to improve matters and until the mass producers advance in education and learn to stand on their own legs in the matter of organisation and co-operation very little could be done. The principle of co-operative sale and purchase appears to be the only remedy, and active propaganda work for the cultivation of the co-operative spirit should be vigorously undertaken.

(b) The existing system of marketing and distribution of agriculture produce are not satisfactory. There are too many middlemen who come in for their share of the profit at the expense of the producer, i.e., the cultivator.

The channels of marketing and distribution from producer to the consumer will be gathered from the chart given below.



Explanatory note.—

- (1) *Hat*—a market place where local producers and consumers as well as traders meet once or twice a week for sale and purchase.
- (2) *Mahajan*—A merchant; used to indicate moneylenders also.
- (3) *Aratdar*—A commission agent.

To the small cultivator there are three ways open to sell his surplus produce:—

- (1) He can take them to the market (*hatt*) and sell them either to the actual local consumer or to the petty trader who buys them for cash.
- (2) He can take them to the village shopkeepers who are usually local people in the Surma Valley and generally Marwaris in the Assam Valley, and dispose them off either for cash or in settlement of accounts with them.
- (3) He can wait till some local trader calls at his place and purchases the produce usually at a price very favourable to the trader.

From the local traders or local shops the produce goes into the hands of *mahajans* in important trade centres or towns whence it is sent down to Calcutta for disposal. Usually the local shops have trading connections with the *mahajan* in the towns or trading centres or very often the village shops are branches of the *mahajans* in the town. Moreover, the Marwaris have established a network of trade connections by which even the petty shops in the remotest part of the country are connected with Calcutta firms through two or three intermediaries. Thus the export and import business is well organised; however, the middlemen reap a large profit at the expense of the actual consumers and the cultivators.

Functions of each intermediary and the margin of his profit:—

Local shopkeeper and local trader.—The local trader or travelling purchaser collects the agricultural produce and passes the same to his *mahajan*. Ordinarily he keeps a margin of one to two annas per rupee after paying off all expenses. But when he finds the cultivator in his clutches, by means of any advance or on account of the dire need for cash on the part of the cultivator, he manages to keep a margin as high as four to five annas per rupee. When the trader disposes of his goods through an *araidar* or commission agent, he has to pay about one anna per rupee of gross sale-proceeds and actual expenses but no godown hire. In the case of the shopkeeper, the margin is moderate. Very often he acts on behalf of his *mahajan*.

The subsequent transactions seldom leave a margin of more than one anna a rupee for each intermediary, the usual net margin being six pices to one anna per rupee.

Method of financing each transaction.—As to this, the Marwari *mahajans* get their money from their Calcutta firms or their bankers at 6 to 9 per cent per annum. They again charge 12 to 16 per cent to the smaller *mahajan* who takes a rate of interest varying between 18 to 30 per cent when he deals with the local traders. This is for trading purpose when the money is advanced for short terms only. When money is lent to actual cultivators the rate is anywhere between 24 to 60 per cent. But when advanced against crop, no interest is apparently charged but a margin of 18 to 30 per cent is secured in the shape of lower price or increased weight.

Sometimes the *mahajan* advances money to the local trader to make purchases on his behalf. In such cases either the goods are taken at a price previously agreed upon or only a commission is allowed.

Except in the case of trade with the hill people in the out of the way places, there is no barter to any appreciable extent.

(c) *Steps for improving quality, purity, etc., of agricultural produce:—*

Unfortunately nothing or very little can be done under the existing conditions of local trade. First and foremost, the traders are not prepared to take account of many grades and qualities of commodities and they seldom encourage any producer by premium for articles of quality. Secondly, production is on so small a scale that, in collecting and practical handling of bulky products of low value, it is not an easy matter to respect the various grades. Thirdly, the people also do not appear to appreciate any small benefit that might accrue from putting their articles properly graded. Want of due consideration at the hands of the traders is perhaps primarily responsible for this attitude on the part of the producer.

Thus all these causes work in a vicious circle and have produced the present depressed condition in the quality, purity and grade of agricultural produce.

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This state of affairs can be remedied only by proper organisation among (a) the producers, (b) the traders, and (c) the consumers.

To organise the producers is out of the question for all practical purposes for the present. The traders, i.e., the local traders who collect the produce, could do a good deal if they wanted but as they trade on mostly with false weights and false representations, there is keen jealousy amongst the members of this class and they cannot combine.

The only remedy that deserves to be considered lies in the hands of the consumers. Amongst them the small local consumers are not of much importance and they naturally do what they can to patronise quality and grade.

To my mind the big consumers, such as mills and factories as well as the export traders and brokers, could and should organise and fix standard qualities and premiums for superior grades. But all these would be done outside this Province as the ultimate market is in Calcutta. So practically there is not much for us to do; perhaps we could carry on some propaganda work in bringing the value of grading and selection home to the cultivators. The lantern slides may be requisitioned to help us in this matter.

Steps should be taken to place commercial intelligence at the disposal of the cultivators.

A good deal of benefit might accrue to the producers if reliable market quotation of jute, lac, potato, oil-seed, cotton, paddy, etc., could be brought to the reach of the cultivators at least in important centres. This would at least give a moral support to the actual producers. The publication of regular bulletins of commercial intelligence likely to be of importance of the cultivator requires to be considered.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—This Province is not directly much concerned with the tariffs and sea freights as our produce goes to the Calcutta market first. Generally speaking, higher tariff duties, and sea freights mean disadvantages for the cultivator as he has got to pay more for his purchases and gets less for his produce.

The question of abolishing duties for salt for feeding cattle after making it unfit for human consumption may be considered as such a measure is likely to have far-reaching effects on the problem of feeding cattle and their health.

QUESTION 22.—CO-OPERATION.—(a) The following steps would be useful in encouraging the growth of the co-operation movement:—

(1) By Government—

- (i) Lending money at cheap interest on a large scale either from their surplus of savings or by borrowing from outside.
- (ii) By providing adequate staff for supervision of organisation and inspection.

(2) By non-official agencies—

- (i) By coming forward to take up the responsibility of organisation and management as well by exerting their influence to induce people to deposit their surplus cash with the co-operative banks and societies.
- (ii) By inculcating the real spirit of co-operation amongst the people.

(b) (i) *Credit societies.*—To fully justify their existence, the co-operative credit societies should be in a position to take over the entire indebtedness of the members who are not beyond redemption. At present the resources of co-operative credit societies are ordinarily far too inadequate for this purpose. Another drawback is that very often people came to form a co-operative society without properly understanding the principles.

(ii) & (iii) *Purchase and sale societies* have got great disadvantages in the fact that qualified men with necessary business ability are rarely to be had and it is almost impossible for the amateur to compete with the professional traders who very often do not have scruples to adopt even unfair means.

(iv) Generally speaking, the education and mentality of the people are not suited to undertake co-operative association for digging wells, construction of bunds, walls and fences or planting of hedges. But the reserve funds of co-operative societies may be utilised for these purposes.

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(v) As far as I can see, I do not see the slightest chance of successfully working co-operative societies for the purpose of aggregation of fragmented holdings and their redistribution in plots of reasonable size.

(vi) Societies for the co-operative use of agricultural machinery may be useful and successfully worked, but before any such undertaking is launched the efficiency of such machinery will have to be properly tested and demonstrated.

(vii) & (viii) Co-operative societies for joint farming and cattle-breeding are not likely to succeed at this stage of the movement.

(c) I do not think legislation will succeed in compelling unwilling people to co-operate.

(d) Co-operative credit societies have been of great help to the members where they are working properly but in some places they are in a moribund condition.

QUESTION 23.—GENERAL EDUCATION.—(a) The present system of general education appears to more or less alienate the educated people from agricultural pursuits. This has already had considerable effect on the rural population. For the prosperity of the rural population, it is highly desirable that agricultural education should be combined with rural education by providing suitable courses in the middle school. The pupils in the elementary school would be too young for taking up any agricultural course while those in the higher classes in the high school will be too much removed from rural environment to find it agreeable.

(b) (i) For this purpose practical as well as theoretical courses should be introduced in the middle schools established in rural areas.

(ii) & (iii) Primary education is not yet compulsory in Assam. It will affect people harshly if it is made compulsory.

As soon as a boy is big enough to be of use to his guardian, his services are utilised in cultivation and household work and consequently he has to leave the school.

QUESTION 24.—ATTRACTING CAPITAL.—(a) Under the present system of agriculture, cultivation does not pay well if the landowner is not himself a tiller. Consequently there is practically no room for the middle-class men to take up cultivation and it pays them better to get their land cultivated by share system. Moreover, the small size of the holdings makes it impossible to take up farming on sound economic lines. But in order to remove unemployment and discontent amongst the educated middle-class people as well as in the interests of more intensive production with the application of labour-saving devices and improved methods and manuring, farming on a large scale should be encouraged by all means. The following measures may be considered in this connection:—

- (1) Leasing out waste lands on favourable terms.
- (2) Steps for aggregation of fragmented holdings.
- (3) Issuing land improvement loans on liberal scale.
- (4) Supplying costly machinery on hire-purchase system.
- (5) Carrying on experiments on the relative value of commercial crops of different kinds and also on methods of cultivation. This could be better done through model farms.

(b) When the landowner does not himself cultivate the land but leases it out there is not much incentive to improve his land; again when a cultivator does not own the land he cultivates, he is not interested in its improvement. So is the case when the land is heavily mortgaged.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) Truly speaking, those who hold office under the Government and live in towns or visit the villages only occasionally can scarcely know the actual economic and sanitary condition of the villages. There should be some suitable local organisation to work as intermediary between the Government Department of Sanitation, Co-operative Societies, Agriculture and Industries and the people. I should think the village authorities should be extended and so modified as to take up all this work actively and qualified officers should be appointed to advise them in their working.

(b) It is highly desirable to carry on intensive surveys of typical villages and obtain sufficient information on all important matters regarding rural well-being and prosperity so as to enable the authorities to find

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out the relative value of the various factors of improvement in the rural economy as well as to discriminately estimate the value and importance of the various problems connected therewith.

The scope of the inquiry should include the following:—

- (i) Material and pecuniary resources of the cultivator.
- (ii) How to improve the above.
- (iii) Household expenditure and other charges which the cultivator has to meet.
- (iv) Facilities for education, sanitation, etc.
- (v) Incidence of the following on the general well-being and prosperity of the rural population:—
 - (1) Loss through sickness and bad health of the people.
 - (2) Loss through cattle disease, insect pests, scarcity of rainfall, heavy rains and floods, damages by wild animals, etc.
 - (3) Loss through want of good market facilities, usurious interest and want of banking facilities.
 - (4) Margin for increased income due to—
 - (A) Better marketing facilities, cheap finance, etc.
 - (B) Agricultural improvements consisting of—
 - (i) Cattle improvement.
 - (ii) Improvement in implements and cultivation.
 - (iii) Improved seed.
 - (iv) Improved rotation and manuring.
 - (v) Use of labour-saving devices.
 - (vi) Better care of crops and supervision.

(c) Recently an inquiry was made into the economic condition of a village in the Silsugar district for which purpose an officer with several years of experience as an Agricultural Inspector had been deputed to work under the direction of the then Deputy Director of Agriculture.

The inquiry was not exactly on the lines I suggest above; however, it was sufficiently wide to give a thorough insight into the economic condition of the village. The broad conclusions from the inquiry so made would be as follows:—

The main handicaps to economic progress are—

- (1) Illiteracy and mental inertia prevailing amongst the cultivators which make it difficult for them to imbibe new ideas.
- (2) Want of facilities for proper education to achieve higher standard of living and high ideals of life before them.
- (3) Want of incentive to keen competition for sharpening the intelligence.
- (4) Fragmented and scattered holdings.
- (5) Lack of facilities for subsidiary occupations and industries.
- (6) Poor cattle and draught animals.
- (7) Indebtedness and usurious interest and lack of finance.
- (8) General alienation of ownership of land from the actual tillers of the soil into the hands of moneylenders and non-cultivating classes.

Supplementary Note on Irrigation.

The paddy growers, who form the bulk of the cultivators in Assam, grow only paddy, in some places only one crop and in others two crops. Excess of water and water-logging in the rains and want of soil moisture in the winter work as the limiting or controlling factor in introducing a rotation of crops and growing cold weather or spring crops. When we shall be able to think of irrigation and drainage of the paddy fields we shall also be able to improve the standard of cultivation of the paddy growers.

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At present cultivation of *rabi* crops scarcely pays except on alluvial tracts near the river banks or on special tracts, where soil is fertile and sowing can be done rather early without fear of destruction by late rains. On many occasions the crop would not pay the cost of fencing and harvesting.

Thus drainage and irrigation of paddy lands with the object of increasing the yield of paddy by eliminating the factor of drought and introducing other crops on paddy lands, and also irrigation for *rabi* crops, appear to be great problems for agricultural development in Assam.

The following special problems may be taken up in this connection:—

- (1) Survey of marshy places for reclamation by drainage.
- (2) Survey for improvement in the *Dong*, i.e., local canals for irrigation in the northern part of Kamrup, Mangaldoi, and Goalpara.
- (3) Survey of the Bhogdoi Valley for a large perennial irrigation scheme.

Irrigation for boro, i.e., spring rice.—In the lower tracts of Sylhet district, the spring rice is the main staple crop of which there are about 191,300 acres. *Boro* could not be grown without irrigation at least for a part of its growing period and the irrigation necessary is at present done by crude methods. Power irrigation would be of great help in various ways. The improvement of irrigation for spring rice is an important problem.

Oral Evidence.

25425. *The Chairman* : Srijut Laksheswar Barthakur, your appointment is that of Deputy Director of Agriculture?—Yes.

25426. You have given the Commission an interesting note of the evidence which you wish to give. Have you anything which you desire to say in amplification of that note, or shall I proceed to ask you one or two questions?—You may ask me questions.

25427. Would you give the Commission, very shortly, the story of your own training and past experience?—I was trained in agriculture in Japan. I was there for four years, from 1905 to 1909. After coming back to India I tried to start a sugar factory, and started a small sugar plantation, but I could not get sufficient capital, and I had to give it up. Then I was taken into the department as a Superintendent by Mr. McSwiney who had visited my farm and was pleased with the work. I served in the Surma Valley for three years ; I was then transferred to the Assam Valley, and after working there for some time I was allowed to act as Deputy Director of Agriculture, when Mr. Birt went on leave. After working for sometime again as Superintendent, I again got the chance of officiating as Deputy Director. Then I was once provisionally appointed Deputy Director, and my appointment was recommended by the Government of Assam as well as by the Government of India to the Secretary of State, but the Secretary of State did not accept that recommendation and I had to revert. After that I was working as Superintendent, and recently when the permanent Deputy Director Mr. Chakravarty went on long leave on account of bad health, I was put in charge of the duties of Deputy Director since September 10th last. During this period of eleven years of my service, I had the opportunity of working on some special deputations also. The first was an enquiry with regard to the disposal of the sugarcane grown in the Kamrup sugarcane farm. Again, the year before last, I was put on a special enquiry on the condition of cattle in Assam, and after the completion of the enquiry I submitted a report.

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25428. Turning to the printed note-of your evidence, you emphasise the importance of a survey of the local and provincial problems, and you say that that should precede the settling of a definite policy?—Yes.

25429. Is it your suggestion that no such survey was ever made before the present policy was recommended?—To my mind, it appears that no complete survey was made.

25430. It is not too late to remedy what you regard as an omission; how would you suggest going about these surveys?—By making a statement, I think I shall be able to indicate what I mean. When this scheme of the Agricultural Department was started by Mr. McSwiney, it was proposed that there should be one Inspector for every subdivision in the Surma Valley, whereas only one Inspector for every district was proposed for Assam Valley. This was done in a haphazard fashion as has been found out later on. To my mind, we should first have considered very carefully the requirements of each subdivision and the problems of each locality, and then gone on to postulate our recommendations with regard to staff. Just at present, the expert staff in the Agricultural Department are thinking a lot about doing good to the cultivator by their scientific methods. But when we go to the ordinary ryot with our ideas, he is actually quite innocent of any knowledge of what scientific agriculture is, and he is not in a position to receive all the benefits of scientific agriculture. Take manure, for instance. Just at present, if we recommend artificial manure, the ordinary cultivator is not in a position to utilise it, and that is the reason why we have failed in making bonemeal popular with the cultivators in the plains. In this way, in other spheres also we must first realise the nature of the problem and then go on to solve it. Take the problem of sugarcane, as another instance. Experiment on sugarcane was the first agricultural research started in the Assam Valley; to my mind sugarcane is not even the second, nor the third, nor the fourth subject which should have drawn the attention of the Agricultural Department here. We spent more than Rs. 6 lakhs in work on sugarcane on the Kamrup farm. We have also been working at Jorhat for the last twenty years for the improvement of sugarcane cultivation, spending Rs. 10,000 a year. In my opinion, sugarcane takes fifth or sixth place in importance in the agricultural produce of Assam. We gave out some superior sugarcane varieties but the cultivators are unable to utilise them properly, on account of the loss due to damage caused by jackals.

25431. You do not feel that the cultivator is getting his money's worth?—That is so. The money spent on sugarcane research has not been repaid in the shape of improvement in the ryot's cultivation. In this way, there are lots of problems which might be worked at but difficult to be solved, but to my mind all those problems should be arrayed and studied by some practical man, we should consult popular needs and popular requirements and the real needs of the cultivator, and then we ought to find out which problem we should tackle first. We had an Agricultural Chemist who worked for a long time; that post was suspended as soon as Mr. Meggitt retired, and Dr. Mitra, the Economic Botanist, was taken in. Now, there is talk of having a Mycologist and an Entomologist, and, it may be, other officers. But we have to decide before taking any step whether they will meet our real requirements.

25432. How do you divide the responsibility between the Director and yourself in the matter of deciding which problems shall be attacked?—After we have got a list of the problems, we should consult not only the Director but the public also. Generally speaking, the Deputy Director would take the initiative.

25433. Under present conditions, who decides which problem shall receive attention, the Director or you yourself?—In fact, as we have got a regular settled programme, the question of deciding which problem to take up does not arise at all; we have got the programme and the machinery to work and we are working.

25434. On the question of fragmentation of holdings, you say, "This is an All-India problem and a problem mainly for the Legislature." Do you mean that you are waiting for the hint from somewhere else in India as to how to solve this problem?—No; what I mean is that it is a common problem all over and we need not think it so important just at present as we have lots of waste lands for expansion.

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25435. If there were legislation, would it not have to be legislation by the Provincial Government?—Yes.

25436. On the question of irrigation, do you feel that there is an opening for minor irrigation schemes in the Province?—Yes, I do.

25437. How do you suggest that Government could assist the carrying out of minor irrigation schemes?—I think what we require is to demonstrate the use of power irrigation. If we could introduce power irrigation, perhaps we could put more areas of higher level under *boro* paddy, thereby making them free from damage by floods.

25438. In answer to the question on Fertilisers you refer to the "enormous cattle manure and compost manure wealth of the Province, 80 per cent of which now is unconsciously thrown away". What do you mean by "compost manure wealth"?—What I mean is this that the cattle dung and household refuse should be stored under a shed, and properly utilised at the time when it is required for manuring our garden crops.

25439. In answer to Question 14, where you are talking about agricultural implements, you point out that improved implements will necessitate improved animals because of the extra traction power required. Have you any suggestions to make for the improvement of draught animals in the Province?—As I have already said, a special inquiry was made and a special report has been submitted in which I have discussed the whole problem of cattle improvement in the Assam Province. It is hoped that by the various means suggested therein we will be able to get a better class of draught animal.

25440. Is it the case that very few of the draught animals used in the plains are bred in the plains? Where are they bred?—Along the Brahmaputra there are lots of grazing places and there are a large number of professional graziers. They keep cattle and produce draught bullocks and draught buffaloes. Then, again, a large number of bullocks are imported every year from Bihar.

25441. What tracts of forest do the graziers frequent?—Forests are not frequented by graziers. There are special professional graziers' reserves. Besides, there are large areas of grass and reeds on the Brahmaputra banks where graziers usually keep their cattle.

25442. Have you any suggestions other than those set down here for the improvement of the draught animals? Is it a question of an improved beast or a question of improved fodder-supply?—Both.

25443. Do the cultivators rely more upon the cow-buffaloes for milk than upon the ordinary cows?—In the village, ordinary cows play an important part, but with professional graziers or *gouralas*, buffaloes are very popular.

25444. Is there a tendency on the part of the cultivators to neglect the cows and not to feed them sufficiently?—Their common practice is to leave the cattle to pick up what they can.

25445. You cannot have good bulls if your cows are not properly nourished?—Quite so. The main trouble lies with the general system as well as with the standard of cultivation. Paddy cultivation does not require highly improved cattle because the cultivation is done at the time of the rains. About 25 to 30 per cent improvement in the cattle will be quite sufficient to meet the paddy cultivator's requirements and for that I do not think high class cattle are necessary.

25446. Under the heading Animal Husbandry, you say that the obvious conclusion to which the fact that the cows in Assam are so bad leads you is that the climate is ill-adapted for cows but better adapted for buffaloes?—It has got to be properly investigated.

25447. You are satisfied that that is the case?—I think so.

25448. You do not think that it is due to better feeding of cow-buffaloes?—There is no special feeding for the cow-buffaloes. The same sort of treatment is meted out to both the cow-buffaloes and the cows.

25449. Why does not this Province suit cows?—I think the rainy season is very wet and the moist heat is prejudicial to the cow. During the cold weather also, we get about two months when the ordinary grass fodder becomes more or less scarce. The people are leisure-loving and

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do not take particular care of their cattle; they are not so industrious as to produce artificial fodder for their cattle; thus the cattle are not properly fed.

25150. Do you think that buffaloes also come off as badly as the cows?—Yes; but buffaloes have got some natural advantages. They can graze on marshy places, where plenty of good fodder for them is available in the dry cold season also. Again they can feed on coarser herbage. That makes all the difference.

25151. No doubt they are better adapted by nature to deal with that particular environment but at the same time if the cow is provided with sufficient fodder in the season of shortage she would probably be able to withstand the climate, would she not?—Yes, quite so.

25152. When you are considering the problem of the Veterinary Service in the Province, why do you suggest that that Service should be under the Director of Agriculture?—The welfare of the cattle and the progress of agriculture are very closely connected with each other; so I think it will be better if the practical side of the Veterinary Department is in close touch with the Agricultural Department. What I mean to say is, that the higher research work and the scientific portion may remain separated but the actual treatment of village cattle should be under the Agricultural Department.

25153. What do you think of the herd of cattle at the Shillong farm?—The trouble is that we do not know the pedigree of the bulls and there is no pure breed from which we can breed them.

25154. And yet the herd has been in existence since 1896?—Yes. The policy has been changed from time to time. Just in the beginning, I understand, they started with cattle from Bhutan, which are almost like English cattle in appearance. They found that they did not suit this Province as they were not good milkers and the stock was mixed and no fixed type could be developed. Then it was thought that the Taylor breed from Patna would do better here and they were imported. Then we had also some of the Montgomery strain introduced. In this way we have been roaming about with the result that there has been no definite pedigree established.

25155. On page 53 in your answer to Question 16, you say that in Assam people keep many more cattle than they can properly look after and you propose that this practice should be discouraged by active measures. What do you mean when you say, "this practice should be discouraged by active measures"?—The cattle are let loose for the greater part of the year; that goes against the interests of improved cultivation. If we could restrict them from that point of view and if we tried to make them keep their cattle under guarded condition, throughout the year, then I think the number of cattle would be restricted and both the quality and the value of the cattle would be improved.

25156. In answer to Question 17, sub-sections (b) and (c), you say, "Subsidiary industries may be of two kinds, one contributing to the comfort or improvement of the standard of living of the cultivator and the other yielding him cash return." I do not see why you suggest that the first category, that is the one contributing to the comfort of the cultivator, should require no special training?—What I mean to convey is this, that there are certain articles which can be manufactured without much skill for domestic use as for example, mats and common wicker work. But there are certain other articles of commercial importance which will require high technical skill, and for these articles we will require special training. But for the ordinary articles of domestic use no special training will be necessary; that is what I mean.

25157. Is weaving on the loom popular in the Province?—It is quite popular in the Assam Valley; there it is an industry which is to be found in almost every household.

25158. What is the thread used?—So far as cotton weaving is concerned, they purchase the yarn.

25159. Where is it obtained from?—The coarse texture is obtained from Indian mills and the finer is imported from abroad.

25160. Is the produce of these looms used in the home or sold in the market?—Generally, it is used in the home, but there are some people who make it a point to earn their living by means of the loom and they produce finer things which are marketed.

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25461. Do you find the looms used in the hills?—They do use a kind of loom in the hills but it is rather crude and they produce only rough cloth.

25462. Is not that a direction in which an industry that contributes to the comfort of the home might be deserving of a certain amount of propaganda?—Yes; and that is being done by the Industries Department.

25463. On page 55 you say, "Only industries connected directly with the preparation of raw materials to bring them to the marketable condition may flourish in rural areas; otherwise, generally speaking, local conditions in rural areas in Assam would not be suitable to the development of industrial concerns. It would perhaps not be desirable to industrialise rural areas, which will greatly disturb the village life and bring in undesirable effects." What exactly are you thinking of when you say that?—For industries we require a special kind of labour. Our villages are scattered and are not thickly populated and I do not think we will get a real industrial population there. For instance, we cannot encourage weaving and spinning as factory industries in the villages. But things like the ginning of cotton and the baling of jute might be encouraged in certain localities with advantage.

25464. What are the undesirable effects that you are talking about?—Agricultural life is somewhat different from industrial life. In industrial life generally, we have got to concentrate labour and we have got to house a larger number of people in a small area and in that way the sanitation is affected. The mentality of the people may be changed. Along with mills and factories the habit of drinking country liquor and other bad habits have come into existence to an extent which is not found among the agricultural population.

25465. You find the rural population ready to take up these spare-time occupations with a view to increasing their means a little?—They have got to; otherwise cultivation will not give them a good living.

25466. Would you turn to the chart on page 57 which you prepared to show the channels of marketing. What produce do you refer to?—The ordinary agricultural produce, oil-seeds, for instance. It applies to oil-seeds mainly; that is the only important agricultural produce.

25467. I just want to understand the chart. If you take the left half, the small cultivator, he may either sell to a local *hat*, or to the local shop or to the local trader. Then if he sells to the local shop, I take it that is the last link between himself, i.e., the producer, and the consumer, is it not? The local shop deals only with the consumer direct?—Yes; it deals with the consumer, but a part of the commodity is sent out to the *mahajan* and to the bigger merchant.

25468. From the shop?—Yes.

25469. That is what I wanted; so that the local shop acts in that case as a merchant?—Yes.

25470. It buys outright and then sells to the local *mahajan*, is that right?—Yes.

25471. Now, is that a matter of the local shop selling the surplus produce that it cannot dispose of by retail sale, or is it a regular business on the part of the local shopkeepers?—I cannot follow.

25472. The local shop is mainly concerned with its retail trade, is it not?—Yes.

25473. It may be that the local shop buys rather too much of one kind of produce and has a surplus and it gets rid of that surplus by selling it to the local *mahajan*; is that right?—Quite so.

25474. Now I want to know whether the local shop deliberately buys the produce with a view to selling it to the local *mahajan*?—Yes.

25475. I do not quite understand how these lines are drawn in the way they are. The local shop sells in the ordinary way direct to the local *mahajan*; is that right?—Yes.

25476. Then you see the line goes up from the local *mahajan* and goes round to *aratdar*. Does the local shop sell through the commission agent, the *aratdar*?—If it is not directly connected with the local *mahajan*, it sells through the *aratdar*.

25477. And it might sell to the big *mahajan* direct through the *aratdar*; is that the idea?—Yes.

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25478. Now would you mind telling me, with regard to your answer to Question 20 (b) on page 56, how you arrived at these estimates of the margins on which the various intermediaries operate?—From my actual experience.

25479. Your own experience?—Yes.

25480. You give us some interesting figures about grading. Let us take two kinds of produce, first oranges. Where are oranges packed for the Calcutta market?—We have got two localities, one, the southern portion of the Khasi Hills on the Sylhet border; there are lots of orange gardens there; the oranges are taken by manual labour to the plains; from there they are taken by small boats to Chhatak, and from there they are taken by big boats down to Calcutta. All along they are kept in loose condition; there is no packing right down to Calcutta. Special platforms are made of bamboos in the boats and the oranges are placed about one foot in thickness and in this condition they are taken to Calcutta; that is one system. Then, with regard to oranges grown in the Sylhet plains, they take them down to the railway station; at the railway station they are put in baskets and taken to Chittagong; from Chittagong part of the oranges go to Burma and the rest are locally consumed.

25481. Consumed in Calcutta?—Of the quantity which goes down to Chittagong, part go to Burma and the rest are consumed there locally. Here in the Assam Valley we have oranges, some near Gauhati and some in the Mangaldoi sub-division; they also are taken down to the railway stations, very often in carts in loose condition; at the railway station they are put in bamboo baskets and then sent to Calcutta.

25482. Are they of mixed quality or of even quality, speaking broadly?—They are of mixed quality. They are generally of two or three grades according to the size; but still they are on the whole of a mixed quality.

25483. Do you happen to know whether there is an export trade in oranges?—Out of India?

25484. Yes?—I do not think so, except to Rangoon; because Calcutta is a big market and the fruits which are produced in this place can be consumed in the Calcutta market.

25485. *Prof. Gangulee*: And they are graded up there when they reach Calcutta?—They may do a bit of grading there; but in these localities we have two or three grades only, not more than that.

25486. Do you think the price of oranges in Calcutta bears the cost of grading and packing?—I do not think proper packing will pay just at present.

25487. Where are potatoes packed if they are packed at all?—Here in Shillong they are put in bags and taken to Gauhati and transported.

25488. And not packed again?—They are packed in bags.

25489. They are not re-packed?—No.

25490. How do they grade?—They do not grade; but the cultivators themselves have three grades generally, one big size for the Calcutta market, one medium size which is used for the ordinary market and the other small size.

25491. Is that grading effected by hand-picking?—Yes, hand-picking.

25492. *The Chairman*: Further, in answer to Question 22 on page 60, you are very despondent, I notice, about the success of any attempt to consolidate fragmented holdings on a co-operative basis. Are you aware of the successful efforts that have been made in other parts of India in that direction?—No; I have not read much literature on this subject, but I know the mentality of the people here; their educational attainments and their local conditions make me despondent.

25493. Then you say that you think it would be a good thing to inculcate the real spirit of co-operation amongst the people. Is any attempt being made to inculcate the real co-operative spirit?—Our Co-operative Inspectors and Agricultural Inspectors are doing something in that direction, but they are over-burdened with their ordinary routine work; so they have very little time to spend on real propaganda work.

25494. I see in the next paragraph you say that co-operative credit societies should be in a position to take over the entire indebtedness of

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their members, or of such of them whose affairs are not beyond redemption. Do you suggest that credit societies as at present constituted and financed should undertake that class of work?—No; there is not enough capital for that purpose.

25495. In answer to Question 25 (b) on page 61, you give us a list of headings which might, in your view, form the basis of a detailed survey of a village. Would you be inclined to include an accurate statement of the size of a holding with the details of fragmentation? Would that be helpful?—Yes.

25496. And also statistics of debt?—Quite so.

25497. Do you find the incidence of debt very heavy on the cultivators in the plains?—I do not think the incidence of the debt is heavy, but the interest is so high that it stands in the way of further progress.

25498. Have you ever known of a case of a cultivator who was seriously in debt being able to clear it off by his own efforts?—Generally, what they do is, they sell off part of their property and begin again.

25499. You have known of no case of a cultivator having any margin of income, over and above what is required for his family and himself to live upon, which might be available for wiping out his debt; have you or have you not?—There are very few instances of their keeping their property intact and at the same time extricating themselves from debt by means of agricultural income. They generally part with part of their property and then start again. There are lots of land in Assam and there are lots of new openings in trade and commerce. If a man is resourceful he can begin a new life and get on well.

25500. *Sir Thomas Middleton*: You have been to Japan, I think?—Yes.

25501. Did you study there in an institution?—Yes.

25502. For how many years?—I was in the college for three years.

25503. Afterwards?—Afterwards I was working in a sugar factory.

25504. You were studying in a college of agriculture?—Yes.

25505. Can you answer this question? Your best rice crop in Assam is Spring rice, and you get about 1,000 lbs. an acre. In Japan the average produce is about 2,800 lbs. How do they manage to do it? It is nearly three times as big an yield as you have got under your best conditions?—In Japan, the holdings are very small and they do very intensive cultivation; so the conditions are different.

25506. Your holdings are also very small?—They are much smaller there and the Japanese cultivator's life is an economical life. He has no land lying waste; in his fields there is no room for weeds to grow; he takes crop after crop; for him the soil is his only lavatory; he supplies as much irrigation as is necessary and he gets the maximum possible crop; he also puts in good and sufficient manures.

25507. Then do you attribute the large crop mainly to the manure?—Manure and regular water-supply.

25508. We understand that in Assam you have got as much water as you want?—Not necessarily; even in Assam there is a lot of land which cannot be placed under good cultivation for want of water. The rain falls and the water goes away; it is not properly conserved. There may be water 9 inches or 1 foot below the surface or in a drain close by the paddy field, but it will be of no avail.

25509. Did you form the impression that they have more productive varieties of rice in Japan?—I do not think so; it is due to the manure and the condition of the soil.

25510. Careful cultivation?—Yes; careful cultivation.

25511. You have given us a list of problems on pages 46 and 47 of your replies. You suggest investigating the value of tillering as against heavy ears of rice. Was that a suggestion that you have got from Japan?—No; that is my own experience, my personal observation. In each head of paddy we find 250 to 500 grains, and then again from one seed we can expect to get three heads of mother plants, not to speak of the tillers. So it comes to about 800 to 2,000 times. When it is so prolific we need not bother about tillering. In my experience, I have seen that if we have a large number of

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tillers they rob the mother plants of a good deal of nutrition and weaken them; at the same time in the cooler part of Assam when the cold weather sets in there is shortage of water and warmth and the tillers do not develop properly.

25512. So your conclusion is that you should work for big heads rather than tillers?—That is my confirmed conviction.

25513. That same conclusion has recently been come to by one of our British experts in the case of wheat?—It might be.

25514. Your next point is the study of the flora of the rice field. Do you mean weed flora?—Yes.

25515. What weeds were you thinking of?—I am not quite sure; but I have observed different kinds of weeds on different kinds of soil and I think an indication of the weed flora will be very helpful to the cultivator or the practical agriculturist in prescribing the manure and devising methods to kill them.

25516. Is that also your own idea or is it a suggestion which you have got from Japan?—That is my own idea.

25517. Water-hyacinth has been mentioned as one of your pests in Assam?—Yes, especially in the Surma Valley.

25518. Why is the manure made from hyacinth not appreciated by the cultivator?—It is not that they do not appreciate it, but it involves so much trouble.

25519. The manure is good but troublesome to prepare?—If they took the same trouble in other ways they could get better manures.

25520. More cheaply than from water-hyacinth?—I am not quite sure about that, but they could produce better manures in other ways.

25521. But if you were endeavouring to get rid of the water-hyacinth, would it not be necessary to find some use for it?—To my mind water-hyacinth is a blessing in a way.

25522. I think Bengal will supply you with as much as you want?—We ourselves have got the weed in some places; it is dangerous in the Surma Valley, but it will be a blessing in the Assam Valley where we have numerous small stagnant ponds; if this plant is put into these it will take up all the plant food from the water and thus purify it. We have got other water weeds which infect our ponds and trouble us very much. But if we put in water-hyacinth it will drive away all these.

25523. If you can make some use of the water-hyacinth then you get some benefit, not otherwise?—Of course; manure is the only use for it.

25524. Are you in charge of the potato work in the Province?—Yes.

25525. Is it important to secure early planting?—In the plains it is; but we cannot do it on account of the rains; there is the fear of late rains.

25526. What is the best time for planting, take first in the hills?—In the hills they are planted for the summer crop in the month of March; I am not closely connected with hill agriculture.

25527. For the plains what is the best time?—As soon as possible after the rains are over.

25528. That will be about what month?—October in the Assam Valley and November in the Surma Valley.

25529. Then you have had difficulties of the seed going rotten?—Quite so.

25530. What is the cause of the difficulty? Bad storage?—I think it is due to potato blight.

25531. Do you not think that in storing your seed potatoes in trays, you should not put so many in a single tray as you have done in Shillong farm?—It is true; but people want a very cheap material for planting; they are not prepared to pay a higher price.

25532. You cannot expect good results from potatoes stored in the way in which you store them here?—What you saw in the Upper Shillong farm is in much better condition than what we find in the case of the ordinary potato growers or dealers; they keep them two or three feet deep.

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25533. The potato disease is a great trouble here?—Yes.
25534. Do you spray regularly on your experimental farms?—Yes, we do generally and also in the districts by way of demonstrations.
25535. How many times do you spray?—Usually two and sometimes three times.
25536. Do you find that quite effective?—It is effective.
25537. Is your practice followed to any extent by the cultivators?—Some of them follow it; but I do not think that many of them care to do it.
25538. What is the reason? Is it on account of the expense?—Firstly, their mentality is not yet prepared for any sort of improvement like that.
25539. Although their potatoes were in danger of being entirely destroyed, they would not spray to protect them?—The real reason is this: they prefer to depend upon chance. Sometimes when the disease is not severe they get a good crop; they would rather wait and see than take preventive measures. So if there is a severe attack of the disease, they suffer very badly.
25540. What do you call a good crop? How much?—Here in the hills 50 to 60 maunds per acre and in the plains 80 to 90 maunds will be considered a good crop.
25541. And the same if attacked by the disease would yield how much?—It would come down to at least half.
25542. You have written a special report on cattle. Has that report been printed?—Yes; it has been printed and published.
25543. Can you tell me whether any of these Bhutia cattle survive here?—There are very few Bhutia cattle in the plains and they are susceptible to rinderpest; of course there are no pure Bhutia cattle; but some indications of them are left in some of the cows in the Upper Shillong farm.
25544. You refer to experimental work in connection with green manures and you note that cowpea as a green manure was a failure?—Yes.
25545. In what respect has it failed?—It has failed as a green manure for sugarcane, as sugarcane cultivation is carried on by the ordinary cultivator on a small scale on small patches; and it is uneconomical to fence the cowpea crop which is very much relished by cattle.
25546. So it was not the fault of the cowpea; the cowpea was destroyed before it was used as green manure?—Yes; another point is that it has to be hoed in at a time when the cultivators cannot spare labour to deal with it because that is the important paddy transplanting time.
25547. You had success with bonemeal in the Khasi Hills but not in the plains?—Yes. In the plains although the results were not unsatisfactory, people did not take it up.
25548. How do you measure the success? Can you tell us what the increased crop in the hills was by the use of bonemeal?—I think one maund of bonemeal produces $1\frac{1}{2}$ to 2 $\frac{1}{2}$ maunds of increased paddy in the first year.
25549. That is in the first year; is it the same in the second year?—In the second year, it is a little less; altogether an average of perhaps two maunds in two years.
25550. Is bonemeal largely used by the cultivators?—In the Khasi Hills it is.
25551. On the question of fertilisers, you say that only 10 to 15 per cent of the cattle manure is utilised. Do you mean 10 to 15 per cent of the total bulk produced? Does your estimate include fertilising matter carried away by the rains?—The wastage includes the washing away by rains. Little of this is used by direct application.
25552. Do they not apply all the manure they have?—In paddy tracts the village washings do go to the paddy fields and indirectly those fields are manured. But my manuring matter may go not to my field but to some other field.

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25553. We will get your views on cattle and cattle improvement from your report, and I shall not question you on that. You note that the price of milk and dairy produce has risen very much recently. Over what period of years is that? Since the War?—It was after the War. I think the increase is mainly due to the expansion of cultivation.

25554. Over what period has milk been increasing in price rapidly?—Within the last six years it has increased very much in Assam.

25555. And you attribute it to the increase in cultivation and the reduction in fodder; is that your explanation?—There is an increasing local demand. Moreover, the area available for grazing for the professional graziers has deteriorated in quality. The professional graziers came from Nepal not very many decades ago. They had a prosperous time up to 1919 or 1920, but by that time most of the suitable areas thrown open to them were eaten up.

25556. That means they kept far too many cattle for the land?—Yes; I have made that point clear in my report.

25557. *Dr. Hyder*: From the table that you have given of the number of days that the cultivator works in different tracts of the Assam Province, I find that the more prosperous the cultivator, the greater the number of days he works. Why is that? Is it not just the other way?—Those who work hard are better off.

25558. You say on page 54, "If we divide the cultivators into three classes according to the keenness of their struggle for existence and on account of diversities of natural advantages, we would probably get the following figures showing the days of labour on agriculture proper." And the figures you give are, "Cultivators of the well-to-do or nourishing class who depend entirely on agriculture, 300 days in the Hills. . . . Cultivators who live a precarious life and also work as labourers in spare time, 180 days in the hills." What is your explanation?—Those people who have got no subsidiary industries have to work harder in the fields than those who have subsidiary industries. Those who have subsidiary industries have a secondary income, and that helps to keep them in good condition.

25559. Then those people who do not have enough land or have no land?—In Assam the question of people having no land does not arise. People have only to go to the trouble of taking up cultivation, because only one-third of the area available for cultivation has been put under cultivation, the remaining two-thirds is still left uncultivated.

25560. The point I want to be clear in my mind is: if a man is not well-to-do and wants to improve his position, he can take up land and he will have to work a larger number of days; is that not so?—Yes.

25561. I think the table is upside-down in other parts of India; the more prosperous the cultivator the smaller the number of days he works. Here the more prosperous the cultivator the larger the number of days he works?—People who are purely agriculturists have to work a larger number of days (it may not be a larger number of hours) than those who have subsidiary occupations. In giving the number of days worked by people having subsidiary occupations, I have not taken into calculation the number of hours they spend on home industries.

25562. You have not included the hours they devote to cottage industries?—No. The heading is, "the days of labour on agriculture proper."

25563. What are the main currents of immigration to Assam?—From Mymensingh and some from Serajganj.

25564. That is more or less permanent colonisation?—Yes.

25565. What other currents?—Labourers are imported by the tea gardens. After working for a time in the tea gardens, they settle near about the gardens.

25566. That is also permanent?—Yes.

25567. There is very little temporary immigration?—Yes; there is very little temporary immigration except of cold weather coolies, *Nuhias*, who come from Bihar for three months and go back.

25568. That is for Public Works Department work?—Mainly for work under the Public Works Department and the Local Boards.

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25569. *Mr. Hazlett* : Do you not think that one of the main causes of the poverty of the Indian cultivator is the fact that he does not work for all the 365 days in the year as the ordinary farmer in most of the European countries? You give the number of days he works. Apparently no man works more than two-thirds of the year?—Where will they work and on what? The agricultural labourer cannot go away from his home. At least it does not suit him.

25570. He can grow garden crops in the winter?—Cold weather cultivation is very precarious. In spite of the 115 inches of rainfall, there is not enough moisture in the soil to grow any good crop in the cold weather which will pay his wages.

25571. You say it would not pay him to cultivate cold weather crops?—Yes. The standard of cultivation is so low.

25572. He only grows one crop in the year, taking it all round?—Yes.

25573. And his time is not fully occupied?—No.

25574. For instance, you take the people from Sylhet who grow the Spring rice, *boro* rice; they start cultivation about October as the water goes down; they prepare the ground and plant their rice, and they reap the rice in March or April. Then, from April to the end of September they do nothing at all?—They have to cut grass for their cattle; that is their main occupation in the slack season.

25575. Otherwise there is little occupation for them. They do a little fishing?—Yes.

25576. *Sir Thomas Middleton* : Do they cut grass for their cattle?—In the Surma Valley they do.

25577. They cannot work very hard, judging from the condition of the cattle as you describe them?—They have to keep their cattle indoors for months together; there is no place for them to move about. They have got to go sometimes five to ten miles to get grass and that takes a lot of time.

25578. *Mr. Hazlett* : After the Spring rice is reaped, the whole area goes under water; only the village-sites are above water?—Yes.

25579. So, they have got to support the cattle somehow : they even dive down to bring the grass up?—I have described that in a bulletin *Polder Supply of the Surma Valley*.

25580. Then, as regards this new farm you are proposing to start at Khanapara, can you tell me why Government have decided to breed draught bullocks in preference to dual purpose animals?—That is under the advice of Mr. Henderson. My idea was different; I would have gone in for a larger farm on a wider scale and taken up the improvement of the local stock of cattle by selection also.

25581. Was one of the reasons due to the fact that the ordinary man wants bullocks to pull a cart? For instance, he has got to import bullocks from Bihar and Orissa or some other Province. We do not produce bullocks in this Province for cart purposes?—We do not produce the larger type of Bihar bullocks suitable for carts. Production of cart bullocks is not the main problem in Assam; we want plough bullocks for paddy cultivation.

25582. It is your theory that the ordinary Assamese cattle can be improved to make them sufficiently good for the demands of cultivation in the Province?—For paddy cultivation we want only 20 to 30 per cent. of improvement. Costly pair of bullocks, say, bullocks worth Rs. 200 would be quite useless for the paddy cultivator.

25583. As regards administrative problems, I see you consider that the Superintendent of the veterinary staff should be under the Director of Agriculture?—Yes.

25584. Is it not sufficient that the two should be under one Minister? They are both under one Minister at present. Cannot the Minister co-ordinate the work of these departments sufficiently without having them directly under one executive officer?—From what I have seen of the working of the Ministers during the last two terms, I do not think that a Minister can take sufficient interest in the details of the working of the departments as a Joint Director would.

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25585. With regard to the feeding of cattle in this Province, do you not think that we have too many grazing grounds? We have the village grazing grounds and the professional grazing grounds. Does not the mere fact that we have so many grazing grounds more or less prevent the cultivator from growing fodder crops? So long as his animals can pick up sufficient food to keep them alive by utilising these grazing grounds, he will not grow fodder crops?—I do not think the grazing grounds we have got are quite sufficient for the requirements.

25586. My point is that so long as we have these grazing grounds, and so long as the cultivators have something upon which their cattle can live somehow or other, they will not grow fodder crops?—In my report on the Assam cattle, I have noted on this problem. The average output of a pair of paddy plough bullocks is 12 *bighas* of land, that is a pair will cultivate only 4 acres of paddy land. There is work for this pair for four months in the year. The gross value of the produce will be Rs. 250 to Rs. 300, and there is no work for the bullocks for the remaining eight months of the year. The cultivator cannot afford to grow fodder for feeding such a pair of bullocks for the remaining eight months of the year. So, unless and until we can change the methods of cultivation of the paddy cultivator, we must provide for free grazing. That was the custom from time immemorial, and, unless and until we have entire economic changes in the method of cultivation, we cannot propose to do away with the village grazing concession.

25587. That is necessary?—Yes.

25588. Of course you agree, I think, that village grazing grounds are bad from many points of view; they spread epidemic diseases, they make selective breeding impossible, and they have many other disadvantages?—Yes, I agree. In my Report on Cattle, I have suggested that the people should be compelled to keep separate a small plot of land as their own grazing ground, and I have given it the name of *neej gochar*. My idea is that if we cannot make any economic change in the system of cultivation, we have got to determine the monetary value of the grazing concession according to the size of the area which we shall have to give to the cultivators. After determining that, we should give half of it as a grazing ground to the whole village, and half of it should be provided to the individual cultivator in his own holding. This can be shown in the settlement as *neej gochar* grazing land, for which a very low rate of revenue may be charged. Thereby, we will incidentally compel the cultivator to keep a plot of land especially set apart for grazing purposes.

25589. *Sir Thomas Middleton*: Would he enclose that land?—He would, if necessary. My idea is that public grazing is no man's property, and it is not possible to improve it. Constant grazing without any manure leads to economic waste. If the cultivator has his own plot of grazing land he can fence it if necessary. He will in time be able to manure it and improve it, and that will be very useful for the improvement of his own cattle and other economic improvements. The sooner you begin this process the better, because every year the value of land is increasing and the problem is getting more and more difficult.

25590. *Mr. Hazlett*: In the written evidence of the Dewan of Gauripur, it is stated that some cultivators put a piece of land under grazing for some years and then transfer their cattle to another piece, putting the old piece of land under cultivation, and thus getting a rotation of grazing and cropping. Do you not think that something like that might be useful? The land may be kept under grazing for two or three years and then put under a crop?—The system mentioned by the Dewan of Gauripur is accompanied by temporarily putting up the cow-shed also which greatly helps conservation of cattle manure and improves the cultivation much beyond what we find elsewhere; but if we let a piece of land go fallow and leave it for a few years for grazing purposes, I do not think it will improve; it will deteriorate.

25591. For ordinary crops it will deteriorate?—Yes.

25592. The general experience is that if it is kept under grass for two or three years, you can grow better crops on it afterwards?—Yes, it is on account of the rest. But the system is not suited for improving cultivation. We have got to aim at a system which will gradually take us to intensive cultivation; with the increase of population, the pressure on land

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and the increasing value of land, we have got to improve the system of cultivation and cannot afford to keep the land fallow for a long time; simply keeping it for the purpose of cattle grazing will not improve the land.

25593. I have read that the ordinary grass vegetation of Assam is deficient in some of the salts which are necessary for cattle, and that you can never hope to produce a good type of ox unless that deficiency is made up; do you know anything about that?—That is quite possible, but as yet we have had no experiments made on this line, and we are not in a position to say anything. While I was conducting my enquiries on the question of Assam cattle, I came across some localities where the cattle appeared to do exceptionally well; I found that the cattle on one side of a river were doing well, while those on the other side were very poor. I attribute that to the difference in the quality of the fodder, which may be due to the condition of the soil in the two areas. We have got to study this problem.

25594. I understand that you are in favour of developing the buffalo?—Quite so.

25595. Possibly, the buffalo may be a more suitable animal to develop than the ox?—Yes.

25596. *Sir James MacKenna*: I am rather curious to know when you went to Japan to study?—It was in the year 1905.

25597. Before we started serious agricultural training in India?—Yes; then there was a regular movement of young students going out of India for study; some went to Japan, some went to America, and some went to England; as I was poor and had not sufficient means to go to America, I took the first opportunity and went to Japan.

25598. What did you study?—Agriculture.

25599. Are you a native of Assam?—Yes; I belong to the Sibsagar district.

25600. Do you belong to the cultivating class?—No, I am a Brahmin, but it does not prevent me from studying these problems. I own some land, and I have to get it cultivated through hired labour, which is much more difficult than cultivating it with one's own hands.

25601. As Deputy Director, do you do any research work?—The Deputy Director here, under present conditions, has absolutely no time to think of research, not to speak of doing research; he has no time to read magazines or books. His office work, the accounts and other things, take up the whole of his time. Formerly we had two Deputy Directors; under the recommendations of the Retrenchment Committee one of them was taken away, but the work has increased three times. At present one man has to do six times the work that was done by Mr. Birt.

25602. I was wondering who did the research. You have a lot of Demonstrators, Superintendents and Inspectors; I want to know what research work is done to enable these officers to keep themselves employed?—Jute seed we got from Bengal. So also *Indrasail* and the *Katakira* seeds; the *Georgesail* was produced by a gentleman of our district by chance; and the research station at Karimganj which was started some time ago has produced the *lafisail* and some *aus* varieties. For sugarcane, we have done a lot of work at Jorhat.

25603. In the matter of agricultural education, you suggest that a number of middle schools might be converted into agricultural schools; have you considered the difficulty of getting suitable teachers for these schools?—We have got to get the teachers, as we get the Inspectors; to start with only three or four schools will be necessary, and we will not require many teachers for them.

25604. How would you train them?—They will have to be taken from the agricultural colleges.

25605. But you have not got one?—We shall have to go to other Provinces.

25606. On the question of demonstration and propaganda, you refer to sugarcane varieties. I do not know which these are; are they improved canes?—We had striped Mauritius, B. 147 and B. 376, which have come out very well; they were being tried by the cultivators for a long time;

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they are good canes so far as their plantation and sugar content are concerned, and they are suitable for plantation conditions. For the ordinary cultivator's requirements they are not quite suited on account of damages by jackals. The *tana* variety was once tried at Jorhat; it was found inferior and discarded; it was re-introduced from Bengal, and now it is being used on a large scale. J. 33a is a small thin cane; that was found to be very rich in sugar, and we tried to introduce it among the cultivators; it was quite hard and not susceptible to damage by jackals, but as the cane was thin, the cultivators did not like it because they want a dual purpose cane; sometimes they want to manufacture *gur* out of it, and sometimes they want to sell it for chowing purposes; so, it is not very popular. We are trying D.74 and Co.9; they are much more hopeful.

25607. Which variety suffers the least from the attacks of jackals?—All soft and superior canes are liable to attack by jackals.

25608. Have you any thick-skinned canes which resist attack by jackals?—D.74 is one we are trying, it is a thick cane, and it is likely to be popular with the cultivator. There are some other canes which we will be able to show you when you visit Jorhat.

25609. Have you any idea of the extent of the cattle traffic from Bihar? Have you got any figures?—I have no figures, but my own idea is that from Rs. 5 lakhs to Rs. 15 lakhs worth of cattle are being imported from Bihar; ordinarily it will be worth Rs. 10 lakhs to Rs. 12 lakhs; that is from Bihar side. From Bengal side we import some cattle into Surma Valley, but I have no idea as to the volume of the trade.

25610. You say that oil-cakes are being extensively used in growing sugarcane, fruits and vegetables; where is this oil-cake obtained from?—There are lots of oil mills in Assam.

25611. It is locally manufactured?—Yes.

25612. *Prof. Gangulee*: You have been the Deputy Director for a few months?—I had officiated for about four years in the past and have now been put in charge since September last.

25613. You have already mentioned the nature of your duties as a Deputy Director. You have four experimental farms here and you are in charge of these farms?—Yes.

25614. Who plans the experiments?—We prepare a cropping programme every year.

25615. I find from the list that you have a number of experiments and you have them in rotation. I was wondering who plans out these experiments and also what is the method of doing them?—A scheme was enunciated when the farms were established and we are still carrying on that scheme. According to that scheme we have got to prepare a cropping programme twice a year to suit the seasons. That programme is prepared by the Deputy Director and is passed on to the farm manager who sees that it is executed.

25616. Do you sit around a table and discuss the nature of experiments?—Yes, we do.

25617. In the case of Karimganj farm you have got a list of twelve experiments. I wonder who plans out these details?—My predecessor, the Deputy Director, did it.

25618. What experiments are going on now? You have got four farms; we will have them all one by one. Let us begin with the Upper Shillong farm?—Potato experiments are carried out there.

25619. Both varietal tests and immunisation from disease?—We are testing imported varieties of potatoes.

25620. So, at the Upper Shillong farm, you have varietal tests of different kinds of potatoes and also the experiments of immunisation from potato disease?—Yes. Besides, there is also the work on cattle-breeding.

25621. Now, let us come to Jorhat farm. What experiments are carried on there?—Sugarcane is the main thing there especially with reference to the superiority of yield of *gur*. Now, we are taking up the new varieties of sugarcane which are immune from jackals.

25622. At the Jorhat farm you are carrying on experiments with sugarcane. Are you also carrying on varietal tests?—Yes.

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25623. What experiments are being carried on at the Karimganj farm?—There experiments are being carried on with rice.

25624. Who looks after hybridization?—That is the work of the Economic Botanist. The scientific portion of the work is under the Economic Botanist; the Deputy Director is responsible for the general work of the farm and he is also responsible for other experiments which are not controlled by the Economic Botanist. We also carry on manurial tests and field tests of different varieties.

25625. So, there again you are having varietal tests and manuring tests?—And also cultural experiments.

25626. Then what about the Titabar farm?—That is also a rice station. It has been in existence for about three years.

25627. Out of these four experimental farms, two farms are devoted to rice work. Are you in touch with any rice work done elsewhere in different parts of India?—I am not in touch with that work. Of course, I have seen some reports.

25628. You are not in touch with the breeding work done in the Madras Presidency and elsewhere?—No, I am not in touch with that.

25629. Do you know the nature of the work they are doing there?—I am not aware of it but Mr. Chakravarty might be aware of it.

25630. You are not aware of the paddy breeding work in the Madras Presidency even through literature?—I have seen some literature on the subject now and again.

25631. You know the nature of the work?—I cannot say that I have studied it very closely.

25632. Your Director told us that he was aware of some farms in this Province which are run by middle-class young men. Are you in touch with these people?—I am.

25633. Are they running these farms on economic lines?—It is still too early to say.

25634. What is the average area of these farms?—One farm is 300 acres.

25635. They are growing chiefly commercial crops?—Yes.

25636. Do you know whether these young men have been trained in agricultural colleges or are they just *bhadralog*?—There are one or two gentlemen who have had agricultural training.

25637. You are in touch with these people?—I am.

25638. With regard to seed distribution, you are aware of the activities of the co-operative societies in this work?—Yes.

25639. They are flourishing in that direction?—Yes; they are useful.

25640. Are you quite satisfied with them?—In the matter of seed distribution, we have got to consider different seeds separately. So far as the question of paddy seed is concerned, it is not sold at all. The cultivators would like to have a few seers of seeds and they themselves propagate them. But potatoes are being sold on a large scale.

25641. In the resolution of the Government of Assam I find this sentence which I will read out to you, "The distribution of seeds through co-operative societies fell off slightly, however. The result is due largely, in the opinion of the Director, to the want of interest shown by the officers of the department in the Suima and the Lower Assam Valleys." Could you explain to us to what situation the reference is made here?—In some places there was some trouble about the quality of seed potato in the previous year and its sale fell off slightly.

25642. Are you aware of the remarks made by the Government of Assam?—I am aware of them. But the fall was not very severe; it might have been partly due to different reasons.

25643. With regard to agricultural finance you say that the scope of the Agriculturists' Loans Act should be extended and adapted to the cultivators' needs. Have you any concrete suggestions to make?—Under the Agriculturists' Loans Act only small amounts are advanced which are not sufficient to help the indigent cultivators.

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25644. With regard to the fertilisers, I was rather struck the other day at the Upper Shillong farm with the wastage of manure that is going on there. There is an amazing lot of wastage. Are you carrying on an experiment with regard to the preservation of farm manure?—We tried to popularise covered sheds because pits are not suitable in Assam as water gets in during the rains. In the Upper Shillong farm there are two sheds. One of them has been blown away and it has not been replaced. We are going to have a new manure shed soon.

25645. Are you aware of the Pusa investigations, with regard to this problem of preserving farm manure, which are being carried out by Mr. Joshi?—I am not aware of them.

25646. Is there any arrangement for testing seeds?—Yes; the Economic Botanist tests the seeds.

25647. Both with regard to purity and germination?—Germination is tested in the seed depot also; we keep a record of it.

25648. Before you send out your seeds to the cultivator, are you aware of the percentage of germination?—Yes.

25649. You guarantee the percentage of germination?—We cannot guarantee always. We have often got to purchase our seeds in the market. Sometimes we get them from Bihar, especially the seeds of pulses.

25650. With regard to the cultivation of fodder, are you aware of the investigations done elsewhere? Do you know the Bangalore experiments?—I do not know the details. I have not studied them closely.

25651. With regard to your suggestion about a Cattle Trespass Act, how would the local bodies view your proposal?—They would resent it very much.

25652. You do not think the local bodies would view the proposal favourably?—I do not think they would welcome it. They want more money for their roads.

25653. You have pit silos in your Upper Shillong farm. Are you carrying on any experiments elsewhere?—We have just tried an above-ground bamboo silo in Jorhat farm. It has proved a success to some extent but the sun is too strong on the one side and the stuff becomes too dry. We are however carrying on with that experiment. I do not think the ordinary cultivator will take to silage making.

25654. Why not?—If they would preserve all the paddy straw, they could feed their cattle tolerably well, but even that they will not do; besides they have got other resources.

25655. They do not feel the necessity of silage?—The necessity is there but they do not care for the better standard of keeping cows.

25656. You realise the importance of silage?—Yes.

25657. In your new cattle farm which you propose to start at Gauhati, you propose to carry out some silage experiments?—We propose to grow our own fodder there and make silage out of that.

25658. With regard to the question of marketing, you have stated in your note that steps should be taken to place commercial intelligence at the disposal of cultivators. Have you any suggestions to make in that connection?—What I mean to say is that if the Calcutta market price for lac, jute and cotton is properly advertised, it will be of some use to the people.

25659. We understand that. What I want to know is the nature of the machinery that you would like to create to transmit the commercial intelligence to the farmer?—You know that some of the papers publish the prices; they may be made available to them. Besides, a special bulletin might be published under theegis of Government.

25660. But the farmers are illiterate in this country?—It would be better to try it; as the people are interested in the prices they would try to obtain information for their own benefit, because the rise and fall of the market affects them very much.

25661. You say the co-operative credit societies in some districts are in a moribund condition; can you tell us why that is so?—Well, in most cases, their idea in forming a co-operative society is that they will pick up a few friends and form a society, get a loan from the Central Bank and distribute it amongst their friends. In this way when it is a matter

of a few friends or a few interested persons it becomes moribund. A lot of loans are made, very little of which is used for the right purpose.

25602. You mean that the co-operative societies are not based on co-operative principles?—They are based on co-operative principles, but the people who are carrying on the societies, the village people, are not yet sufficiently educated, or they have not yet imbibed the spirit which is necessary to preserve these organisations. I do not say this applies to all societies, it only applies to some societies.

25603. On the question of general education, I cannot understand your remark that primary education will have a harsh effect if it is made compulsory?—In the agricultural areas we find students flocking to the schools when there is no pressure of agricultural work, but as soon as the paddy cultivation is in full swing the boys are taken away from school to attend to the cattle. If primary education is made compulsory, cultivation will suffer to a certain extent.

25604. Do you think that tendency is peculiar to India?—Here the standard of living is very low and people do not work so hard, so that until the people change their habits and their mentality, it will be rather difficult.

25605. You have told us that you have in this Province 18,000,000 acres of culturable waste?—Yes.

25606. In answer to our Question 21 on page 60, the first measure you suggest is to lease out waste land on favourable terms. Is there any proposal before the Government to lease out any part of this land?—Waste lands are available for settlement on ordinary terms but there is no provision for specially favourable terms.

25607. Have you any suggestion to make as to how this area could be leased out to willing persons?—If we are to encourage farming by middle-class men, we shall have to aim at large farms. To open up such large areas will take a long time, and if full revenue has to be paid from the very beginning, I do not think even a gentleman cultivator will be able to make a start unless he has a very big capital. In some cases Government might help these gentlemen farmers by giving concessions, as they did in the case of the tea industry.

25608. In Japan were you in touch with the Young Men's Associations?—Yes.

25609. You had occasion to observe their activities and come in contact with them?—Yes.

25670. Can you tell us why we cannot organise similar institutions in our own rural areas?—It is a very difficult problem. In India, the real national spirit is wanting; there is not that feeling for national welfare and for institutions which have a real national value; that is the main defect. As we have not that spirit, it is very difficult for us to do anything of the sort in India.

25671. Have you made an effort in this Province to start an organisation of that sort?—We ought to try, but in Assam all the people possessing the best intelligence are looking for Government service and so are not in a position to participate in such organisations.

25672. *Mr. Calvert*: With reference to the last question put by Professor Gangulee, would you say the difference in the two countries rests with the leaders or in the people themselves?—The people are the raw material and the leaders are the organisers; unless we have good material, we cannot produce good things; so that I should say the difference in the people is a much more important thing than the difference in the leaders.

25673. But in Japan there are a large number of persons organising these 'getting-up early' societies, physical training societies and village improvement societies, while here you have not?—No, we have not got it. In Japan all organisations are backed by the State and there is a thorough system. When they want to start something new, they go out not only to one country but to all countries, to America, Germany, France, England, Sweden, Switzerland; they pick up the best ideas they can find and bring them back. When I was in Japan some Japanese ladies went to Sweden and Switzerland to study the question of physical culture of females; when they came back they organised it in Japan. At one college I found a military officer lecturing on the art of riding while in the same hall a commercial gentleman was lecturing on the art of packing

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goods. That seemed very strange to us Indians. They go out to different countries, bring back the best knowledge they can find there, and inculcate their young people with that knowledge. In Japan every young person feels that he lives for his country; he thinks for his country. It is the same with Government servants, private workers and commercial people. It is not so in India.

25074. In Japan there is more effort towards self-improvement?—Yes, there the whole country is one; if you convince a Japanese street loafer that he should die for his country, he will do it. We do not find such things in India.

25075. In Japan is not night-soil frequently used as a manure for paddy?—Yes, both in Japan and China. But for the use of night-soil there would be famines in China and Japan.

25076. The night-soil from towns is used for the paddy fields?—Yes; in the City of Tokyo there are no sweepers to remove the night-soil; every household has a night-soil pit which it lets out to a cultivator, who pays Re. 1, Rs. 2 or even Rs. 5 for the privilege of clearing it for one year. There are also large drains to receive the sludge of sewerage, and at low tide cultivators come in boats to take away the sludge for use on their paddy fields.

25077. Is that extensive use of night-soil the cause of the higher output of paddy there?—I think so.

25078. Is there any hope of getting people here to use night-soil on the same scale?—That is impossible; we cannot think of using night-soil in India unless it has been allowed to rot for a long time.

25079. It is a question of prejudice?—Yes.

25080. So that prejudice is partly responsible for poverty?—Yes. There is one thing I think we can do; near towns on trenching grounds we might grow maize, Guinea grass and other green fodder and use them for feeding cows in towns.

25081. In Japan did you see anything of the consolidation of fragmented paddy fields?—When I was in Japan, they were starting that movement.

25082. You did not actually investigate the methods?—I did not investigate, but I heard of the movement. In Japan fragmentation went very far. In Japan they do not use cattle for agriculture; they use manual labour, so that fragmentation did not affect them so much; but they were taking up the consolidation movement and I learned that they were successful. Commissions were appointed consisting of two or three Commissioners for particular localities, and they used to go from village to village adjusting the holdings to agricultural needs.

25083. I presume the obstacles to be overcome were very similar to the obstacles to be overcome here?—It may be, but I think the laws of the country were possibly quite different.

25084. But the same questions as to differences of soil or proximity to water-supply would arise there as here?—Yes.

25085. Do you not therefore think there is some hope of consolidating fragmented paddy fields in Assam?—Yes, it is necessary; it is going to be very serious in the near future, because the Settlement Reports show we are having 3 to 4 acres of land for each household. In the next generation I think that will be reduced to one-third or one-quarter; but at present, as we have got plenty of fresh land, people can move on.

25086. Why is it that the Japanese make economic use of their rice straw for plating and for paper while in Assam it is not made use of?—The standard of industrial life is quite different in Japan; they live at very high pressure. Not only do they use rice straw, the Japanese cannot afford to throw away waste paper. There is no waste in Japan; all the waste paper is preserved and is used as felt in weaving certain rough carpet-like things. So that their position is quite different. In Assam we waste so many things; we waste timber, we waste fuel, we waste everything; life in India is full of waste. There is no comparison between life in Assam and life in Japan.

25087. So that you think waste is also a cause of poverty in this country?—Quite true.

The Commission then adjourned till 10 a.m. on Tuesday, the 14th December, 1926.

[Srijut Laksheswar Barthakur]

Tuesday, December 14th, 1926.

SHILLONG.

P R E S E N T :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.	|	Mr. H. CALVERT, C.I.E., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.		Professor N. GANGULEE.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.		Dr. L. K. HYDER.
		Mr. B. S. KAMAT.

Mr. J. HEZLETT, I.C.S.
Rai Bahadur RAMANI MOHAN DAS. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Srijut LAKSHESWAR BARTHAKUR.

Further Oral Evidence.

25688. *Mr. Kamat* : You received your agricultural education in Japan, and you said you stayed there three or four years?—Four years.

25689. Would you kindly help the Commission by telling us what is the system of agricultural education in Japan as a whole? If you like, you can commence from the agricultural college at the top and go down to the agricultural schools, or you may begin from the bottom and go up to the top?—I shall begin from the top. There were two important State Universities and an agricultural college, which was subsequently converted into University. Both the Universities have got agricultural colleges with excellent farms and fully equipped laboratories, and different branches of agriculture are taught there. In the Tokyo University they had an Agricultural Chemist from Germany; the rest of the staff were their own graduates who were trained in foreign countries for four or five years and even for a longer time.

25690. The majority were Japanese?—All of them were Japanese, except a very few experts.

25691. A few experts were brought from foreign countries?—Yes. The other college in which I studied, the Sapparo Agricultural College, which was converted into the Hokkaido University was organised by a staff of American Professors who remained there for four or five years to organise it.

25692. In all, how many agricultural colleges are there in Japan?—There are three colleges for the whole of the country.

25693. Below the agricultural colleges, what is the system of agricultural schools?—There are a large number of agricultural schools; I could not tell you the number, but just like high schools here there are a large number of schools with purely agricultural courses, and in all these schools they have got their own farms and laboratories.

25694. You mean regular farms or only small plots?—Regular farms. They have got excellent stations in every Province which co-operate with the agricultural institutions. Apart from agricultural schools they have got sericultural schools. Sericulture is an important subsidiary industry of the Japanese cultivators. But for sericulture a lot of Japanese would have died of starvation. Then, they have fishery schools; fishery is a very important branch of agriculture there.

25695. Below these high school agricultural classes what are the smaller schools?—I do not think there is any smaller school.

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25696. If a boy of 14 years of age wants to begin his agricultural education, where does he begin?—He does not begin his agricultural education at 14. He begins it after passing the middle school course (which is our high school standard). After finishing his middle school course he will take to the special agricultural schools, and if he wants to study higher agriculture, he goes through the college course.

25697. *Prof. Gangulee* : There you have special secondary schools in each prefect?—I do not think in each prefect, but there are schools in very many centres.

25698. *Mr. Kamat* : And the instruction is given of course in Japanese throughout?—Yes.

25699. In the college course, the whole of the instruction is in the vernacular?—Yes. They put in the technical terms in English and in German on the board. All science students take up German as a second language.

25700. The scientific terms are given in the vernacular and German?—In English and German.

25701. Will you tell me how research work in Japan is co-ordinated? For instance, how is the research work on different problems in the various research stations in different Provinces co-ordinated?—They have got a central agency, the Department of Agriculture and Industries, and they have got under that agency special experts to supervise all these institutions.

25702. Will you describe the central agency in a little more detail? Is it an official agency or a semi-official agency?—It is an official agency;

25703. Purely official?—Yes.

25704. No non-officials serve on it?—It has no non-officials.

25705. It is in fact a department of the Central Government?—Yes; it is termed the "Department of Agriculture and Industries."

25706. What is the procedure for co-ordination? Is it done by the various officers in the Provinces being called to headquarters, or is it only by correspondence?—The expert staff of the department go out and consult locally.

25707. You mean the Central Government sends out research workers to the Provinces to visit the research stations; that is the method of co-ordination?—Yes; I was in Japan between 1905 and 1909, and matters must have changed a good deal by this time.

25708. I am asking only of the things that were in your time. At that time the method was that the Central Government sent out their officers to the different Provinces to watch what research work was being done?—Yes.

25709. *Rai Bahadur R. M. Das* : You say you have your headquarters at Jorhat. Is that a fairly central place from which you can conveniently look after your farms and demonstration circles in the different valleys?—Geographically it is not very central, but practically it is fairly satisfactory.

25710. If you consider it a convenient place from which to look after the farms and the work of your officers, would it not be an equally convenient place for the headquarters of the Director of Agriculture?—I am not quite sure about that, because the Director of Agriculture is the administrative head, and he has to be in close connection with other heads of the administration and with the Government. Perhaps it is better for him to be at the seat of Government than away from the capital.

25711. Would it not save a lot of his time and a lot of expense to Government in visiting the different parts of the Province?—The Director has not got to visit these localities so often. He has got to go out on periodical tours. I do not think it matters much, his headquarters being stationed at Shillong.

25712. How long does it take to go from Sylhet to Shillong?—Two days.

25713. From Jorhat you can reach Sylhet in 24 hours?—Yes.

25714. In Jorhat you have got a farm and also a laboratory?—Yes.

25715. It is an important place from an agricultural point of view?—Quite so.

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25716. You stated yesterday that you have got four farms in charge of Managers and Assistant Managers. Are they all graduates of agricultural colleges?—With the exception of one they are.

25717. Which one?—The one in Jorhat.

25718. What agricultural training has the Manager of Jorhat farm had?—He has had practical experience.

25719. What agricultural education?—Academic education he has had none. But he has had practical experience by serving in the Jorhat farm, Dacca farm, and working in the Khagrahari sugar farm; and he was subsequently appointed as a Farm Manager.

25720. He has no agricultural education. You have an Assistant Manager in charge of the Karimganj farm?—We have an Assistant Manager, but he works under the Manager.

25721. He is sometimes put in charge of the farm?—Yes.

25722. What agricultural education has he had?—I could not tell you. I understand he was in Bengal for some time and was trained in farms there.

25723. Your Inspectors are all graduates of agricultural colleges; are they not?—Yes, all of them.

25724. Are some of them also Inspectors of Co-operative Societies?—Only three.

25725. Have these three Inspectors any knowledge of economics?—They have been given training in co-operative organisation; that is all that I know about it.

25726. What training in co-operation have they received?—The Assistant Registrar gave them the training.

25727. Have they studied co-operative literature?—I am not quite sure how far they have studied it, but as they are put in charge of co-operative organisation, they must be in touch with the literature of the movement.

25728. You have got 56 demonstrators, and you pay them from Rs. 30 to Rs. 50?—That is the permanent scale.

25729. Have they any theoretical knowledge of agriculture?—No; they have practical training on the farms.

25730. Your Director told us yesterday that the cultivators are sometimes reluctant to allow your demonstrators to demonstrate on their fields. Is not that reluctance due to the fact that the cultivators, and with some reason, believe that they have nothing to learn from your demonstrators?—When the demonstrators were first introduced the people were reluctant to allow them to demonstrate, but afterwards when they come in contact with our work and are impressed with the good results they generally co-operate with us.

25731. Do you think that your demonstrators know more about cultivation than these old cultivators who have been cultivating their lands throughout their lifetime?—Generally speaking, they know more than the cultivators, because they are recruited from the rural areas; in addition to that they are in touch with the departmental activities, and they are also trained both on the farm and by the Inspectors specially.

25732. How long are they trained?—They are supposed to be two years on probation and two years on the farm.

25733. Do you think they acquire more practical knowledge of agriculture than the cultivators during this period of two years?—According to my experience, a large number of them are really good agriculturists.

25734. How many Inspectors have you?—15.

25735. Have you not got 56 demonstration circles?—Yes; there are 56 demonstration circles.

25736. After doing the inspection of these 56 demonstration circles, do you find sufficient time to plan experiments in the agricultural farms in your charge?—Demonstration is supervised directly by the Inspector, and his work is supervised by the Superintendent; the Deputy Director scarcely finds any time to supervise the demonstrator's work.

25737. I am speaking of planning, not supervising. In answer to a question by Professor Gangulee, you said yesterday that you plan experiments in the four agricultural farms; I ask you, do you find sufficient time

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to do that?—The cropping programme is prepared by me. I also work out the general plan of work.

25738. Do you find sufficient time to plan the experiments in the four agricultural farms of which you are in charge?—So far as the preparation of the plan is concerned, I find time to do it, but I cannot attend to the details of the work and supervise the details.

25739. Practically, you cannot properly supervise?—Of course, a man cannot be in all the places at the same time.

25740. You told us yesterday that in Japan night-soil is used as manure, and that the people in India are prejudiced against it?—Yes.

25741. Do you know that the Shillong trenching ground and also the trenching ground in Dibrugarh are leased out to the cultivators by the Municipalities at a high rate of rent, for use on garden land?—I am not aware of it.

25742. I tell you it is a fact, and there is no prejudice against using the trenching ground?—The position is somewhat different. Here the night-soil is buried for some time, and there is no obnoxious smell, but in Japan they use it directly; as we handle cattle manure so they handle night-soil, that makes a good deal of difference. I do not think any cultivator will touch night-soil with his own hands, but in Japan every cultivator will handle it even when it is fresh.

25743. You said yesterday that water-hyacinth is a great blessing in the Assam Valley; is that so? That statement requires to be qualified?—It would not be so injurious as it is in other places, and it could be utilised for purifying the ponds and small tanks.

25744. You have often toured in the Surma Valley; do you know that water-hyacinth is doing considerable damage to the rice fields and blocking up the navigable channels in the Surma Valley?—Yes, I know it. I started an enquiry in that connection first in 1915 and I submitted a note, and again later on in 1920, I submitted another note; in those notes I have pointed out all these difficulties.

25745. Have not the Local Government passed a law to eradicate the evil?—Yes.

25746. Are not measures being taken by the Local Boards to eradicate the evil?—It is easy to pass the law.

25747. *Sir Henry Lawrence*: How will it be eradicated by law?

Rai Bahadur R. M. Das: The Government have passed the law, and measures will be taken by local authorities, by helping the people and compelling them, to root out this evil.

25748. *Sir Henry Lawrence*: Is there such a law?

Rai Bahadur R. M. Das: They have passed the law; the Local Boards have been authorised to compel the people to root out the evil.

Mr. Heslett: The local authorities can take special measures themselves to remove water-hyacinth from the waterways.

25749. *Sir Henry Lawrence*: Is it difficult to enforce it?

Mr. Heslett: The law is there, but it is difficult to enforce it.

25750. *Rai Bahadur R. M. Das*: You said something about water-hyacinth as manure; have you demonstrated the use of water-hyacinth as manure to our cultivators?—Yes.

25751. What is the result?—It has given good results.

25752. You said something yesterday about the high price of milk; is not the high price of milk due to a larger demand for milk, to an increase of population, and to a shortage in the supply of milk on account of heavy cattle mortality and degeneration of the breed of cattle?—Yes.

25753. Is not the shortage of milk-supply affecting the health of our people?—I think so.

25754. Would it not be desirable to amend the Cattle Trespass Act, so as to provide that the fines realised from impounded cattle should be earmarked for the improvement of cattle?—Yes; in my enquiry on cattle I have laid some stress on the point.

25755. You said yesterday that the Local Boards might object; do you think they would object if they got sufficient help from Government for

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primary education or for their roads? Would they object to earmarking the fines and fees realised from impounded cattle for the improvement of cattle, if the revenue that they now derive from this source were paid by Government from their own resources?—Of course if their resources are increased, I do not think they will object. Anyhow, it appears to me that the income derived from cattle should be utilised for the improvement of cattle first.

25756. Is there any dairy industry in this Province?—In a petty way there is.

25757. Is there any organised dairy industry?—There are very few dairies; there are some in Shillong.

25758. Do you think that any dairy industry started by a private individual should be subsidised by Government?—If Government could do it, it would be a good thing.

25759. How many honorary correspondents have you got?—I could not tell you the number exactly.

25760. I suppose there are about 23; have you ever tried to induce any one of them to start a dairy concern?—We have not made any experiments in that line.

25761. You spoke of Agricultural Associations in Japan; have you ever asked any of your honorary correspondents here to start similar associations in this Province?—We have tried to start such associations, but till now we have not been able to do it.

25762. You say on page 52, "There is a strong contrast between the powerful and heavily-built Assamese buffaloes and the stunted and miserable looking cattle in Assam." Does that remark apply to the Sylhet district or to the Surma Valley?—It applies mainly to the Assam Valley.

25763. Not to Sylhet, because the conditions in Sylhet are quite different.

25764. How do you propose to tackle the fodder problem in Assam? Has each cultivator in Assam Valley proper got sufficient *neej gochar* (private pasture land) from Government? All the land in Assam belongs to Government?—Yes.

25765. Have Government given to each cultivator a sufficient area of land for grazing his cattle?—No; it has not been given separately to each individual for grazing his cattle, but, if they like, the people can keep some of their land for grazing purposes.

25766. Would you not suggest that, during the settlement operation which is going on now, each cultivator should be assigned such land at a low rate of rent?—That is my suggestion; I explained yesterday the system of *neej gochar* according to my idea; if Government grant a piece of land at a lower rate of rent for *neej gochar*, that will induce the cultivators to keep some of their land for the purpose. I would go further; I would compel every cultivator, wherever possible and practicable, to keep a small area of land as *neej gochar* for which a low rate of revenue should be assessed.

25767. You think, during the present settlement operations, it can be easily arranged?—Yes, that is my belief.

25768. You are now in charge of the distribution of seeds?—Yes.

25769. You make all the necessary arrangements for distribution?—Yes.

25770. You distribute seed potatoes from Shillong to the plain district?—Yes.

25771. Will you tell me where you got these seeds this year?—This year we got our seed potatoes partly from the villages which were supplied with our farm seeds and partly from the bazaar.

25772. What is the good of buying seed in the bazaar and then sending it to the co-operative societies?—The supply of suitable seed potatoes is a big problem. After we have sent our seed from our farms, we are not in a position to control its cultivation and we cannot take any measures against potato diseases. We tried our best to distribute our seed to some localities or villages but I think the supply from them was not sufficient and therefore we had to purchase some from the market.

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25773. You say that you bought your seed from selected cultivators. Did you carefully supervise the work of preserving that seed?—I could not do that and it is not possible also because the ordinary seed purchasing cultivator is not prepared to pay a higher price for the seed. The ordinary practice is that he plants whatever he can get in the market. A few good cultivators might appreciate the value of good seed, but the ordinary cultivators are satisfied with any seed provided it is as cheap as possible.

25774. Is it not a fact that last year the co-operative societies in the Surma Valley refused to take your seed on account of heavy rottago in the previous year?—I do not know the operations of last year; I have had experience of this year. The whole question of the supply of seed potatoes depends on the transport facilities. We have got to supply seed at long distances under unfavourable conditions. We have got to transport large quantities. Possibly in the case of these large departmental transactions, we cannot give sufficiently careful handling. The ordinary petty traders, however, can better look after their small lots of seed.

25775. Is your seed treated before distribution?—It is not possible to treat any seed unless the cultivators are prepared to pay a higher price, which they are not willing to do. They would rather have our untreated seed at 3 or 4 annas less in price.

25776. You seem to attach much importance to the inculcation of the real spirit of co-operation among the people. Do the Inspectors of co-operative societies find sufficient time for this sort of work after doing their ordinary routine work of auditing the accounts of the societies?—We have got only three Agricultural Inspectors working as Co-operative Inspectors and their co-operative work is not extensive.

25777. Do you think that these Inspectors find sufficient time to do this educational work after doing the routine work of auditing?—This work has been given to our Inspectors only for a year and I am not in a position to give my considered opinion on the matter. From my past experience, however, I can say that it is a mistake to entrust the work of organisation and of audit to one staff because, the moment a man has got a large number of societies, he will naturally be reluctant to organise more societies and thus increase his work. Besides, in the work of co-operative organisation the people in the Assam Valley and also in the Surma Valley have got to be trained specially. There should be regular preaching and propaganda work in the villages and for that work I do not think that either the Agricultural Inspectors or the Co-operative Inspectors can have sufficient time unless their number is increased by three or four times.

25778. Do you know that the people look upon co-operative societies as so many cheap loan agencies?—The work done by the co-operative societies has not been spread all over the Province.

25779. I am referring to those places where it has been organised?—The people who are in touch with these societies do regard them as cheap loan agencies.

25780. Is it not because they are not trained up in co-operative principles and co-operative practices that these people look upon these societies as so many cheap loan agencies?—Quite so.

25781. *Sir Henry Lawrence*: In regard to this question of water-hyacinth, have any rules been prepared under the Act?—I do not know; I am not aware of any rules.

25782. Do you know if any action has been taken under the Act?—I am not in touch with that work; it is under the Local Boards.

25783. Does it not affect agriculture?—It does, but this portion of the work has been handed over to the Local Boards. Under the agricultural budget a certain amount of money is granted; it is handed over to the Local Boards and they spend it and organise the work.

25784. Some money is granted by Government to the Local Boards?—Yes.

25785. Do you know how much money is granted for this purpose?—I could not tell you.

25786. Can you find out and let us know?

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Mr. Hazlett : We will find out that information * for you.

25787. *Sir Henry Lawrence* : Have the Local Boards got any executive officers appointed by Government?—They have got their Overseers.

25788. Are they the senior officers in the employment of the Local Boards?—Yes.

25789. Is there any chief officer or executive head? What is the working of the Local Board system here?—I am afraid I am not able to answer that question.

Mr. Hazlett : There is a Board Engineer who is also the chief executive officer; there is no secretary.

25790. *Sir Henry Lawrence* : What pay does that officer receive?

Mr. Hazlett : The bigger Boards pay from Rs. 200 to Rs. 500 and the smaller Boards from Rs. 250 to Rs. 400; he is not a very highly trained officer.

25791. *Sir Henry Lawrence* : Would he have authority to act in matters like the water-hyacinth problem?

Mr. Hazlett : He is the only executive officer.

25792. *Sir Henry Lawrence* : Would the initiative in regard to any action taken for the suppression of water-hyacinth vest in that officer?

Mr. Hazlett : The Chairman of the Board will have to be moved first in the matter and then action will be taken directly by the Engineer. In fact, we have no proper establishment to deal with water-hyacinth except the ordinary Engineer.

25793. *Sir Thomas Middleton* : In answer to a question yesterday, you said that the cattle in the Province were supposed to suffer from some deficiency in the mineral constituents of their feed. What is the deficiency?—It might be lime; I am not in a position to say definitely; the point has got to be investigated.

25794. Have you noticed that in any district of the Province the cattle eat earth?—That is a common practice.

25795. Do they also eat excrements?—I have not noticed that.

25796. In your supplementary paper on Irrigation you advocate power pumping for boro cultivation. What lift of water had you in mind when you advocated that?—Water does not require to be lifted very high for boro cultivation in this Province, generally from four to six feet.

25797. So you want a low lift and not a lift which will pump up water from 20 or 25 feet?—We want a low lift.

25798. *Mr. Hazlett* : As regards the question of the headquarters of the Director of Agriculture, the facts are that Jorhat is 27 hours by rail from Sylhet and Shillong is 40 hours; it is not exactly one day and two days respectively?—Yes.

25799. Then about the question of reservation of plots in a cultivator's holding for grazing purposes. Do you think that it would be practicable during the present resettlement operations to have these plots reserved? Do you think it would be popular if the Settlement Officer laid it down that certain plots bearing valuable crops like sugarcane or cold weather crops should be reserved for grazing ground only?—I think they will welcome it. Near Jorhat they have been compelled to keep small plots fenced in order to let the grass grow. There the grazing problem is very difficult and they have got to keep some land reserved for grazing purposes; they are small plots. But in places where there is no such heavy pressure of cultivation, I think, people will be able to do it without feeling it.

25800. I quite agree that it would be an excellent thing if we could reserve some land, but I am considering whether it is practical or not; that is the important point?—There is no harm in trying it.

25801. You say the price of milk is dear because the cattle are very poor, but I have seen it stated somewhere that the actual milkman or the *gowala* sells his milk at about Rs. 3 or 4 or 5 a maund or 1 anna a seer while we have to buy that milk at 4 annas a seer. Is it not a fact also that the high price of the milk is due to the fact that the man between the actual milkman and the consumer takes the profit, as much as 3 annas a seer? Could that not be remedied by the introduction of some kind of co-operative buying societies or selling societies?—They would be useful no

* A sum of Rs. 5,000 was allotted to the local bodies in the Surma Valley in 1919-20 and a further sum of Rs. 10,000 in 1921-22 for eradication of water-hyacinth.

doubt. I have stated in my Cattle Report that the price paid by the consumer is not received by the actual producer. But by limiting the number of middlemen, or reducing their number or their profit, we should be able to get the milk cheaper. That, however, does not affect the question of milk-supply; the supply is so very short.

25902. But 3 annas is too big a percentage to go into the hands of the middleman?—That is true, but our main problem is to increase the supply.

25903. *Prof. Gangulee*: Do you organise shows or exhibitions here?—We do.

25904. In village areas or in towns?—Originally we used to organise them in towns and even now we have to organise them in towns; but we have got the idea of taking them to the villages.

25905. So that up till now your shows and exhibitions have been confined to towns?—Yes.

25906. With 18 million acres of cultivable waste, as you say, in this Province and with favourable climatic conditions, Assam has agricultural advantages for which it would be difficult to find a parallel in any part of India; do you agree with that view?—I do.

25907. And the average annual net expenditure on agriculture for the last ten years is about 1.11 per cent of the total average annual expenditure of the Province and you feel the necessity of spending a little more on agriculture. Can you think of any source which may be explored for obtaining the additional funds which you would like to have? Have you thought out any scheme in your mind?—I have thought over the matter. There is one way. I think, which would be helpful and that is by organising a professional grazing industry and releasing more areas from the unreserved State forests for this purpose. We have, just at present, 15,692 square miles of unclassified State forests. If we can get about one-third of it, say 5,000 square miles, I should think we can get a good revenue. We can get an income of about Rs. 200 or 300 per square mile by extending this professional grazing industry. At present I think we derive an income of about three lakhs from the grazing tax. It is very unpopular now, but if we really study the problem connected with this industry and go out to help them by organising credit amongst them and by helping them in preventing over-stocking of grazing reserves, I think we can improve their condition, and taxation will not be so heavily felt by them.

25908. That is your idea?—Yes; if this is done we can increase our revenue by a few lakhs of rupees.

25909. *The Chairman*: What is the attitude of the Forest Department towards the cultivators who wish to take up forest land and cultivate it?—I could not tell you; it is a forest policy.

25910. Are you familiar with the sericultural industry in this Province?—Just a bit.

25911. On page 19, paragraph 27, in the series of preliminary memoranda * prepared for the Commission there is a note on sericulture, "The total value of the silk industry produced in Assam is estimated at about Rs. 30,00,000." But in the Census of India Report of Assam, 1921, on page 163, paragraph 156, there are these words, "Of the 490 (persons) recorded under (rearers of) silkworms, 483 depend on *eri* or *muga* worms and only 7 on *pat* worm rearing. All these figures are obviously too low; in many cases doubtless the occupation is subsidiary to one of the textile groups or to cultivation, while admission of breeding the *pat* worm is shunned as it has usually been regarded as degrading". I find difficulty in reconciling those two sets of figures, even allowing for the fact that the statement in the Census Report is an underestimate. Do you know at all how many people are engaged in sericulture in this Province?—I have got no idea. I have not studied the census figures, but to my mind Rs. 30,00,000 would not be an underestimate. Silk-rearing as a subsidiary occupation must have been omitted from the census figures.

25912. It is not the amount but the number of workers that is said to be an underestimate. But you are not familiar with the position?—No; I have not studied the problem.

Mr. Hazlett: In 1918 Mr. Basu, the Deputy Director of Agriculture, made a report and he estimated the value of the total silk industry in Assam at about Rs. 30,00,000.

(The witness withdrew.)

* Not printed: Preliminary Memorandum prepared for the Commission by the Assam Government.

APPENDIX.

Receipts and Expenditure of Local Boards in Assam during 1925-26, under some particular sub-heads concerning cattle and cattle improvement.

	Income from cattle.	Expenditure in connection with cattle.				
	Receipts from cattle pounds (Cattle Trespass Act).	Cattle-pound charges.	Cattle fairs.	Veterinary charges.	Bull and stallion charges.	Contribution to Government on account of services of Veterinary assistants lent.
	RS.	RS.	RS.	RS.	RS.	RS.
1. Silchar	7,841	216	..	1,395	..	1,560
2. Hailakandi	1,427	144	400	951	..	780
3. North Sylhet	8,362	314	..	1,817	..	1,458
4. Karimganj	5,329	108	..	1,636	..	1,560
5. South Sylhet	5,802	108	..	1,543	..	1,560
6. Habiganj	8,663	168	..	988	..	780
7. Sonamganj	10,206	116	..	2,189	..	1,560
Total, Surma Valley ..	47,130	1,114	400	10,729	..	9,258
8. Dhubri	12,289	1,072	..	3,414	..	1,529
9. Goalpara	5,714	8	..	2,152	..	1,459
10. Gauhati	10,155	948	..	2,098	..	1,608
11. Barpeta	3,860	..	..	1,830	..	1,560
12. Tezpur	12,864	581	..	2,864	..	1,560
13. Mangaldoi	7,949	..	..	1,466	..	1,486
14. Nowgong	21,645	46	..	1,903	..	1,560
15. Sibsagar	7,388	1,219	..	2,284	314	1,560
16. Jorhat	9,218	357	..	1,420	..	1,560
17. Golaghat	6,810	1,891	..	1,876	..	1,560
18. Dibrugarh	9,469	53	..	1,826	..	1,560
19. North Lakhimpur ..	6,664	..	..	1,411	..	1,560
Total, Assam Valley ..	1,12,715	5,674	..	24,431	314	18,552
Total, Assam Province ..	1,59,845	6,788	400	35,160	314	27,820

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Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (i) *Organisation.* To organise better research and lessen the top-heavy administration, the posts of Deputy Directors may be abolished and they may be appointed as experts to carry research work on the lines they are well acquainted with. This will automatically increase the provincial research staff and laboratory work with necessary equipment. On the other hand, the Superintendents will be in charge of demonstration and seed distribution directly under the expert Director. If need be, there may be appointed a provincial Deputy Director of Agriculture to help the Director in administrative work and especially in demonstration and seed distribution. If this principle were followed, the organisation of the provincial agricultural research and administration could be well organised economically.

2. The provincial expert staff should preferably be drawn from able and efficient research workers, and there should be more experts and assistants appointed. The present pay of the assistants is not very encouraging. Better pay and prospects should be offered to them if efficient work is desired.

3. Indianisation of the Agricultural Service will surely help in improving the status of the agriculturists at comparatively less cost, as the officers have to deal with mostly illiterate men. But, where necessary, efficient experts may be appointed on contract for short terms to organise the provincial research activities.

4. As the Provincial Governments are not in a position to appoint experts in various lines of research, the Government of India might open a branch station of Pusa Institute in each Province and tackle the problems that can hardly be taken up by the provincial expert staff.

Administration.—The Department of Agriculture should be a separate department by itself and the Veterinary Department may be amalgamated with it. An expert should be appointed as Director. The case of Assam is an anomaly. The Department of Agriculture is amalgamated with two others, viz., the Co-operative and Industries, under a layman Director, promoted from the Provincial Civil Service and no satisfactory work in either research or welfare of the common agriculturists is possible so long as the status of the department remains unchanged. A separate agricultural department is the first and foremost requirement of Assam.

2. The research staff is limited to one expert officer, as Economic Botanist and he is in charge of Chemical, Entomological and Horticultural sections in addition to his own duties. More experts and assistants should be appointed.

Financing.—The money allotted at present for provincial agricultural work is far below the demand. As agriculture is the only institution of 80 per cent of the people of the country, Provincial Governments should spend more money on it. Besides, attempts should be made both by the Provincial as well as the India Government to start a campaign for liberal donation from private sources. The Government of India may also offer a yearly grant to the Provincial Governments according to their need to help and promote the cause of research.

(i) A provincial veterinary research laboratory in connection with the agricultural laboratory is highly desired only in those Provinces where there is no veterinary college.

(b) Progress in Assam has not been made owing to the lack of skilled workers in the following:—

(1) *Dairy.*—Assam cattle are perhaps the poorest in India, and work on this line is urgently needed.

(2) *Horticulture.*—Orange is the most important fruit industry in Assam. Skilled workers to improve the cultural, manurial, handling and marketing problems are wanting.

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(3) *Mycology*.—The potato is the staple crop of the Khasi and Jaintia Hills. Immediate appointment of skilled workers to control the *phytophthora* disease is urgently needed.

(4) *Chemistry*.—Assam proper grows only one crop, rice. The soil being distinctly acid and lacking in adequate amount of humus, *rabi* crops can hardly be grown. The poverty problem of the people here could partly be solved with the introduction of a second crop in winter by treatment of the soil. The re-appointment of a Chemist (the post has already been kept in abeyance) is urgently required.

(5) *Economic Botany*.—(i) Cross-breeding of rice to serve both scientific and economic purposes, although it is done to a certain extent to serve the latter.

(ii) Both field and laboratory studies on the general question of environmental influence upon the quality of rice, especially the protein content as affected by the length of the growing season, of the time of harvest, of the time of sowing the seed and transplanting or broadcasting, of the amount of water-supply, the influence of the soil and other allied problems.

(iii) A few other problems of direct interest to the cultivators are—

- (1) Deep *versus* shallow ploughing.
- (2) Drill *versus* broadcast seeding.
- (3) Rotation of crops.
- (4) Clearing the land from weed both by cultural methods and by chemical sprays.
- (5) Irrigation of rice field from wells.
- (6) Improving the milling quality of rice.
- (7) Use of combined harvester.
- (8) Discing *versus* ploughing the land.
- (9) Green manuring rice fields.
- (10) Change of seed.

(6) *Entomology*.—(i) Campaign against cut-worms (*agrotis*) in Karikatura in Sylhet district in onion and potatoes.

(ii) Dissemination of knowledge about the control of insects.

(c) Research can be taken up on—

- (1) Pure line and selection, and storage of potatoes.
- (2) Disease resistive varieties of potatoes.
- (3) Packing and marketing of oranges.
- (4) Grasshopper control in Hazo, in the district of Kamrup.
- (5) Reclamation of swamp land in lower and middle Assam Valley.
- (6) Canning and preserving of fruits and vegetables.
- (7) By-products of oranges.
- (8) Development of mustard, jute and cotton which are important agricultural products.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) No. Assam has no agricultural institution.

(ii) Yes. In Sylhet, Kamrup and Sibsagar districts.

(iii) Not necessarily.

(iv) No. Agricultural education should be given free on a liberal basis. To stimulate the demands for instruction in agriculture, agricultural courses should be included in the University curriculum, and in the primary and secondary schools as nature study training. Except college education a separate agricultural school for the training of the boys of agriculturists will seldom be a success.

(v) As there is little or no opening in either Government or private service for boys of the middle-class with a training up to Matriculation standard, they want to get a training in agriculture either to get into a service or take up agriculture as business, while purely cultivators' sons have little or no chance to be trained in their profession and so they are not inclined to send their boys to school. Courses should be offered in such a way that they may help them directly. Nature study training, if introduced both in primary and secondary schools, will serve the purpose.

(vi) Mostly not for above reasons.

(vii) Agricultural courses may be offered as electives together with the regular courses.

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(viii) (a) Nature is the best method to train cultivators' boys in primary schools in the villages, where they mostly begin and finish their training.

(b) School plots are essential in giving nature study lessons.

(c) School farms will succeed in places where the land and implements are obtained free.

While the majority of our boys do not go beyond high schools, nature study is the best system of training for the boys who seek agriculture as vocation. But, above all, what is required most is the facility for primary education in rural areas which is wanting.

(ic) In Assam the boys trained in agriculture are quite a few. They have mostly been appointed by the Department of Agriculture.

(x) Agriculture should be added in the curriculum of high schools and agricultural training should be given in the form of nature study training with school plots as electives in addition to training in the 3 R's. There should be lectures in school rooms and practicals in the school plots. With the affiliation of the agricultural courses in the schools the hatred for agriculture is sure to be removed.

(xii) Adult education can be popularised by starting free night schools in villages, where illustrated lectures with lantern slides on various subjects, such as agriculture, public health and sanitation, and social welfare, are always instructive and entertaining.

(xiii) (a) The administration of rural schools may preferably be in the hands of the District or Local Boards. A provincial advisory board for rural education is desired with the Director of Public Instruction as Chairman.

(b) The Government of India may offer a grant to the Provincial Governments, as primary education grant and thus lay the foundation for rural education.

2. Both the India Government and Local Governments may seek donations from private sources for the purpose.

3. Municipalities, District and Local Boards should contribute substantially for rural education.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) Demonstration in cultivators' fields has been successful in Assam. There is no Government demonstration farm in Assam except one in Haflong Hill. No propaganda work has yet been tried except in agricultural shows. Demonstration staff should be increased.

(b) Demonstration will be much more effective if some *bona fide* cultivators are supplied with seeds and commercial fertilisers free of cost or at least at concession rates. They will then have an incentive to use them to advantage.

2. Demonstrators should be recruited from better trained men with better pay. The present pay does not encourage qualified young men to go in for it.

(c) Cultivators must be given to understand that no extra tax will be levied by growing a better crop through the advice of the experts. The expert opinion should be given according to cultivators' ability to utilise it to advantage. Above all, unless the cultivators get the rudiments of knowledge in reading and writing, they will seldom realise the advantage of expert advice.

(d) Other things being equal, demonstration work is always successful in some places where the cultivators are willing workers and want to do something better. Furthermore, demonstrations in middle-class farmers' fields are in most cases successful, as they follow the expert advice and get a better result.

QUESTION 4.—ADMINISTRATION.—(a) Yes. The co-ordination of the activities of the Government of India may usefully supplement the activities of the Local Governments. But this does not mean the decrease in the provincial expert staff and consequent increase in the India Government staff at Pusa. In any case, the provincial expert staff should be increased.

(b) Yes. So far as Assam is concerned there is no Mycologist, Chemist, Bacteriologist, Horticulturist, Entomologist, Dairy Expert Animal Breeder, Agronomist, Soil Physicist or Agricultural Educationist to organise their

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respective lines of work. The Government of India may have a branch station in each Province and take up such problems as need be. There must be some permanent Assistants at these stations to carry out the work.

(c) (i) No. In Assam, the lack of sufficient skilled workers to work with is evident, as there is only one Economic Botanist in charge of the Chemical, Entomological and Horticultural sections in addition to his own duties. Unless more experts and assistants are recruited, no satisfactory results in agricultural work are possible.

(ii) No. In Assam, there is no arrangement in railroad and steamer services for the transportation of fish, fruits and vegetables. Refrigerator cars should be provided for them.

(iii) No. Good roads should be maintained in every important centre. The trunk road from Gauhati to Dibrugarh should be metalled, if possible.

QUESTION 5.—FINANCE.—(a) The Government of India may start a campaign to raise money as agricultural loan, like the War loan. As the country is now wide awake to the needs of agriculturists, an agricultural loan campaign will be highly responded to from all quarters both at home and abroad. This money may be disbursed according to needs of the Provinces for both long and short-term credit.

The Provincial Governments ought to spend more money towards a better financing of the agricultural operations, as they do for the Education Department.

(b) Agricultural officers should advise them in their activities and make them realise the significance of honesty in business.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) The main causes of borrowing—

- (1) The extreme poverty of the cultivators.
- (2) Social customs.
- (3) Failure of crops due to drought, flood, or insect pests.
- (4) Disease and death.
- (5) Lack of sufficient labour.
- (6) Oppression of the mahajans or moneylenders.
- (7) Rise in market price due to unnecessary exportation of rice from the Province, which compels the cultivators to buy at high price for consumption in rainy season, as they are sold out of stock to pay the creditors.

(ii) The sources of credit are—

- (1) Borrowing from mahajans or moneylenders at prohibitive interest.
- (2) Mortgaging ornaments and property to moneylenders or other individuals.
- (3) Advance sale of crops at very low price.

(iii) The reasons for non-payment are—

- (1) Failure of crops.
- (2) Prohibitive interest which is mostly calculated as compound interest. (The moneylenders very often cheat the cultivators in calculation.)
- (3) Disease and death.
- (4) Zamindar's tyranny.

(b) (1) Agricultural associations should be formed in each circle and buying and selling should be done on co-operative principles which will help the farmers to grow a crop and get a satisfactory profit out of it. Each particular staple crop should have an association of its own, such as the rice growers' association, the orange growers' association and so on.

- (2) More agricultural loans to cultivators (commercial growers).
- (3) Co-operative societies in each circle.
- (4) More co-operative credit to the cultivators.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) Yes.

Suggestion—

Co-operative growing of crops or joint farming.

(b) Obstacles—

- (1) Lack of sufficient labour and good implements.
- (2) Lack of sufficient rain water and irrigation facility.

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- (3) Lack of co-operation among the cultivators.
- (4) Lack of sufficient capital to buy one whole area.
- (5) Family partition.

Remedies—

- (1) Introduction of improved machinery, draught bullocks and, if possible, motor power.
- (2) Levelling the land, so that the water does not collect in one place.
- (3) Irrigation facility. In Assam, the cultivators depend on rain water, which is generally stored in the field for rice cultivation by *ails* and raised dams in small areas.
- (4) Co-operation.
- (5) Labour supply.
- (6) Agricultural loans.

QUESTION 8.—IRRIGATION.—(a) (i) In Sylhet district the present method of using the switch basket or *don* in irrigating the *rabi* crops and to a certain extent the rice fields, where the water is available in ponds or ditches, is quite helpful provided it is used extensively.

(iii) Owing to irregular rainfall a vast area of the cultivated land remains idle every year for lack of sufficient rain water. Shallow wells from 10 feet to 12 feet deep dug in the field will do away with the difficulty to a certain extent for petty cultivators. Cultivators in Assam do not use well water in the field. They may be induced to do so.

Obstacles.—(1) Irrigation canal is not possible in Assam proper.

(2) Financial conditions will not allow the digging of tanks or ponds.

Remedies.—*Kutcha* wells may be used to advantage. Water may also be obtained in small streams by raising concrete dams.

QUESTION 9.—SOILS.—(a) (i) Assam soils are distinctly acid and so the application of lime is recommended. Apart from rice and jute land, the rest of the higher levels, where *rabi* crops, sugarcane, cotton and fruits are grown, require drainage. Furthermore, Assam soil lacks in sufficient humus and available nitrogen. Humus should be supplied either by green manuring or application of farmyard manures.

(ii) There are vast tracts of swamp land in Assam bordering the Himalayan region (the great Tarai swamp, as it is known) which may be reclaimed for homestead settlement. Middle-class cultivators, co-operative farming and capital farming are required to reclaim them. The land is suitable for rice and jute in Lower Assam and for *rabi* crops, cotton, wheat, barley, etc., in the middle, and rice and *rabi* crops in Upper Assam.

(iii) For the prevention of the erosion of the hill regions by heavy rains where potatoes and cotton are grown, terrace system of cultivation is recommended. This will check the *ghum* system or itinerant cultivation in hill sides, and instead will establish permanent homestead settlements with increasing revenue to Government.

(b) (i) Jorhat farm soils are distinctly acid; *rabi* crops, sugarcane, wheat, oats and barley were grown after sufficient lime was applied. There are many places in Assam where the soils are similar.

(ii) At Jorhat, the experimental plots produced excellent sugarcane when they were under the supervision of the Chemist four years ago, while the same plots have now deteriorated and produce poor canes. The appointment of a Chemist is urgently necessary in Assam.

The people of Sibsagar, which is known to be a well-known productive rice-growing district, applied to the Settlement Officer, Sibsagar, a year ago to reduce their tax because they cannot produce good crops nowadays as they did a score of years ago.

QUESTION 10.—FERTILISERS.—(a) As artificial manures are too costly for the poor ryots, they should use farmyard manure economically by collecting it in a pit in the form of a compost with a thatched roof above. This is being recommended by the Department of Agriculture, Assam.

(b) By law.

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(c) By experiment in Government farms and demonstration in cultivators' fields.

(d) In Khayri and Jaintia Hills, the use of bonemeal in rice fields has recently increased. Application of farmyard manure from pits has increased in Upper Assam Valley within the last two years.

(e) No, not quite. Phosphatic manures were found to be giving very good results in sugarcane at the Jorhat farm and bonemeal on rice in Karimganj farm. These are being successfully demonstrated outside.

(f) Cowdung is seldom used as a fuel in Assam.

QUESTION 11.—CROPS.—(a) (i) The existing crops may be improved by—

- (1) Using pure seed of high-yielding capacity as recommended by the department and continuing to keep it pure.
- (2) Using farmyard manure and application of water by switch basket where needed.
- (3) Using better ploughs and ploughing deep.
- (4) Sowing in proper time.
- (5) Fencing the crop.
- (6) Adopting some system of rotation.

(ii) The cultivators are averse to try anything new, but they are not fools, because once they understand the value of any seed being tried successfully by a neighbour they will go in for it. More demonstration is wanted.

Assam cultivators are not used to grow fodder for the cattle. The utility of Guinea grass and broom corn needs more demonstration on cultivators' fields.

(iii) The two rice farms at Karimganj and Titabar respectively distribute paddy seeds of improved varieties recommended by the department, viz., *latifail*, *Georgesail*, *murali* M_{14} (aus), *basmati* (fino aus), *birpak* (asra). Apart from these a few other varieties are also recommended. Except rice, the Government farms do not grow any other seed for distribution. Some 50,000 cuttings of improved sugarcane at Jorhat farm and about 500 maunds of improved Shillong potato seeds are grown at the Upper Shillong farm every year for distribution. The great demand for good seed is supplied by buying seeds from outside and local growers. There should be Government seed farms in all the staple crops so as to distribute improved varieties of seeds.

(iv) Free license to guns should be allowed to bona fide cultivators in the areas which are affected by wild animals of which the wild boars and elephants cause considerable damage.

Co-operative fencing is efficient in such a case. There is one such fencing by the railway line in Sylhet.

(b) The recommended farm varieties of paddy always give 1 to 2 maunds more yield per *bigha* (about one-third of an acre) in cultivators' plots than the corresponding local varieties.

(c) Efforts are being made to improve the following crops:—

- (1) *Rice*.—(a) Pure line selection (continued for the last twelve years at Karimganj farm).
- (b) Cross-breeding—F² generation.
- (2) *Mustard*.—Pure line selection (continued for the last one year).
- (3) *Cotton*.—Varietal test (continued for the last three years).
- (4) *Sugarcane*.—Varietal test (continued since 1908).
- (5) *Potato*.—(a) Varietal test (continued since 1900).
- (b) Selection (continued for the last four years).

QUESTION 12.—CULTIVATION.—Improvement on the following lines:—

- (i) (1) Deep *versus* shallow ploughing.
- (2) Preparation of land in winter right after harvest by improved machinery and if possible by motor power so as to grow two crops.
- (3) Green manuring in winter.

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(ii) The following rotation crops are useful in Assam proper of which the former is recommended by the Department:—

Nature of seeds.	First year.	Second year.	Third year.	Fourth year.
Average higher levels for sugarcane.	Plant cane.	Ratoon cane.	<i>Dhaincha</i> or cowpea.	<i>Aus</i> , potato, peas and oats, mustard, <i>matikalai</i> or arhar.
Average lower levels for paddy.	<i>Dhaincha</i> or potato.	<i>Dhaincha</i> or cowpea, <i>sail</i> ground-nut.	<i>Matikalai</i> or <i>Ahesuri</i> , <i>sail</i> .	<i>Aus</i> or jute, tobacco.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(i) The existing measures in Assam for protection of crops from insect pests and diseases are very poor. There is only one Entomological Assistant in the Province. If proper staff is appointed, work may be carried on to save the crops from cut-worm troubles in Karki-Katura, Sylhet, borers in fruit trees, beetles and caterpillars in vegetables, etc. Work on the betel leaf and areca palm diseases is worth undertaking.

(ii) Had there been a Mycological Assistant in the Province, work could be carried on in controlling the *phytophthora* in potatoes, finding out some resistive varieties of potatoes successfully in Khasi and Jaintia Hills.

QUESTION 14.—IMPLEMENTS.—(a) Introduction of improved machinery is urgently required. The department should have an officer to propagate this. If properly handled, many useful and efficient implements, such as ploughs, harrows, etc., can be made by the country blacksmiths provided they are encouraged to do so.

(b) The cultivators will be willing to take up an improved implement if it is cheaper in price, so that he can afford to buy it. Moreover, it must be easily workable in his field and give a good service. Attempt should be made to make the implements locally. The department should have a workshop for the purpose.

The Government also should demonstrate the feasibility of improved machinery and make the people understand the need and efficiency of the same on economic basis. For this purpose, the department should have a set of different implements and a motor tractor with accessories. Assam has really a demand for improved implements and power cultivation.

(c) Manufacturers of improved implements being not quite aware of the necessities of the common cultivators cannot possibly make the implements suited to the need of the cultivators. The manufacturers must stay in the Province, study the problems and then make such implements as need be.

QUESTION 15.—VETERINARY.—(a) There is no reason why the Veterinary Department should remain separate from Agriculture. The amalgamation of the two will be an economic organisation on co-operative basis.

In Assam, the amalgamation of the Agricultural Department with the Co-operative and Industries has been a great stumbling block to agricultural progress. If Assam wants ever to develop the agricultural activities, there must be a separate Agricultural Department with Veterinary included in it under an expert Director.

(a) (ii) There should be at least a provincial veterinary laboratory in Assam, and if need be, this laboratory may be established near the present agricultural laboratory at Jorhat.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) There should be a breeding station in the Province to improve the draught animal as well as milch cows. Assam is perhaps the poorest in live-stock in India. But there are some strains of indigenous cattle which could be well improved by cross-breeding them with other well-known breeds from outside. This has already been proved by the Taylor breed cattle at Shillong. The would-be cattle-breeding station at Khanapara will answer the purpose.

The Local Boards, Municipalities and Union Boards should be asked to maintain bulls.

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Law should be enforced to castrate the stray bulls and weed them out by prompt action.

(ii) There is an urgent necessity for the improvement of the dairy industry. It may be improved by—

- (1) Establishment of a model dairy in the Province.
- (2) Establishment of co-operative dairy farms in district headquarters where the demand is so keenly felt under the patronage of the Co-operative Department.
- (3) Establishment of dairy farms by private individuals to take up dairy industry as a profitable business with the help of Government loans, if required.

(iii) It is the foreigners, the Nepalese, who are keeping up the dairy industry in Assam. So the existing practice can hardly be improved. Assamese should be encouraged to take up dairying.

(b) (i) Yes. Grazing areas are decreasing rapidly.

(ii) Yes. The Assamese do not have any enclosed pasture area.

(iii) The Assamese seldom attend the cattle at home.

They allow them to graze in the field freely. Although there is sufficient straw, they do not know how to save it and use it to advantage. They should be taught to do so.

(iv) Yes. The Assamese do not grow fodder for cattle. Guinea grass is recommended by the department.

(c) Scarcity of fodder is felt mostly in winter.

(d) Improving fodder supply by—

(i) More grazing area.

(ii) Growing of fodder crops.

(iii) Silo and silage.

(iv) Stocking straw properly.

(e) Landowners may be induced to take interest by—

(1) Sufficient propaganda to make them realise the need of good cattle and know how to tend them.

(2) Practical demonstration of growing fodder, siloing and feeding it to cattle properly.

(3) Supply of fodder crop seeds, cuttings or root-stocks free to bona fide cultivators for a time.

QUESTION 17.—**AGRICULTURAL INDUSTRIES.**—(a) In Assam proper, the cultivators grow one crop and so they do not work on an average more than four months in the field. In the slack season they do not do very much except hauling fuel wood to the market, repairing their houses and tending the cattle. As a majority of them are addicted to opium, they mostly pass an easy-going life. If this use of opium could be stopped, they could have a new start in life.

(b) Demonstration of the subsidiary industries and a systematic propaganda are necessary. The Industries Department ought to have a batch of Demonstrators to go round and talk to the people as they do in weaving and sericulture.

Government may aid in—

- (1) Making by-products of rice and milk.
- (2) Making *sathi* food (starch).
- (3) Starch and alcohol from potatoes.
- (4) By-products of fish, fruits and vegetables.
- (5) Vinegar-making from cane juice and tamarind.
- (6) Lump soap-making.
- (7) Weaving by improved hand-looms.
- (8) Umbrella handle-making.

(c) **Obstacles.**—(1) Majority of the cultivators are not acquainted with the industries named.

(2) Many people are prejudiced against such industries.

(3) Lack of sufficient propaganda by lectures and demonstration for which skilled workers are wanting in Government industrial staff, except weaving and sericulture. The latter are doing very good work.

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(d) Yes. Except sugar-making, no attempt has been made in Assam to improve them.

(f) Yes. This will help in improving the rural areas.

(g) The following may help in better rural employment:—

- (1) Selling chopped fodder in market.
- (2) Making fishing nets.
- (3) Broom-making.
- (4) Lime kilns (in Sylhet and Khasi and Jaintia Hills).
- (5) Making dolls and other playthings for children.
- (6) Tinning and soldering.
- (7) Nursery (selling budded and grafted plants).
- (8) Truck gardening.
- (9) Candle-making.

(h) The people should be taught by illustrated lectures about health and sanitation. The Public Health Department ought to have a batch of men to go round the villages. If such a lecture propaganda can be carried well, the people will realise the need and do accordingly to save themselves from diseases and death. In fact, they should be taught how "to make a living" instead of "getting a living." School teachers should talk to the boys about public health and sanitation.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) (i) As there is a dearth of labour in Assam, there could be easy distribution, if the Assam-Bengal Railway would have been good enough to transport the working men from outside the Province at concession rates.

(ii) There are vast tracts of Government arable land lying idle in Assam. If the Government grant for homestead settlement is granted to outsiders, thousands of settlers can settle down in the swamp or grass land, lying on both sides of Assam-Bengal Railway from Gauhati to Dibrugarh, which will develop the country a great deal.

(b) As a majority of the Assamese have some land in their possession, they seldom want to go outside and work for others. It is only the foreign labourers, mostly ex-teagarden coolies, who work as labourers in Assam. The only solution would be to allow the labourers from Bengal to work as labourers.

(c) The Bengal labourers who are mostly from Mymensingh will settle down in swamp areas which are not occupied by the Assamese cultivators. They will serve the dual purpose of improving the swamp land as well as work as labourers in the field.

QUESTION 20.—MARKETING.—(a) No. Specific examples in Assam are the orange market at Chhatak, potato market at Shillong, cotton market at Goalpara and jute at Nowgong. Just at the time of harvest the market is being glutted by the produce and so it is sold at comparatively lower prices. Had there been an organisation of the cultivators for such a produce, they could control the market and get better prices.

(b) No.

Oranges in Khasi and Jaintia Hills are mostly sold to middlemen who sometimes pay in advance. The fruits are sold at Rs. 15 to 20 per 3,000 and taken down the hills in baskets to Tharna and a few other places, whence they are taken down to Chhatak in small country boats. Here the orange merchants come from various parts of Bengal. The oranges are sold to these merchants at about Rs. 30 to 35 per 3,000. The oranges are then carried down to Bengal markets by boats, except a few which are sent to Calcutta by train and steamer. These oranges are sold at 2 to 3 pice at the Khasi and Jaintia Hills and are sold at half anna to one anna each in Calcutta.

Had there been an orange growers' association and the fruits could have been picked, packed and marketed systematically, cultivators could get four times the profit. Besides, the oranges could satisfactorily be boxed in pine-wood boxes which are found in plenty in Khasi Hills and be shipped to Calcutta. Unless the Khasi growers organise themselves, the industry will never thrive.

(c) Suggestions to improve the orange industry—

- (1) Organisation of an orange growers' association in Khasi and Jaintia Hills.
- (2) Hand-picking the fruits in bags by a ladder.
- (3) Grading the fruits in a grader.

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- (4) Packing in standard boxes, 25 to 30 scores in weight.
- (5) Sale to middlemen through the organisation at Chhatak and Sylhet, or ship in car loads, steamer or boat to distant markets in Bengal.
- (d) With the organisation of each industry under an association, such information will be of great use. At present the only organisations that are benefited by it are the Tea Planters' and Jute Merchants' Associations.

QUESTION 22.—CO-OPERATION.—(a) (i) Government should employ more men in the staff to promote the cause of co-operation. The present staff is very limited.

(b) (i) Credit societies should be increased to help the cultivators living in remote corners of the country.

(ix) Social Service League in Sylhet which is not a Government effort.

(d) The co-operative credit societies have been doing satisfactory work in Assam.

QUESTION 23.—GENERAL EDUCATION.—(a) Yes.

(i) College.—There should be a separate agricultural college.

(ii) Secondary school.—Nature study training from class VII to X should be offered as an elective with opportunities to learn a vocation, such as poultry, market and nursery gardening, bee-keeping, in addition to general farming in the school farm.

(iii) Primary school.—Nature study training and school plots suit best from class I to VI. This course may preferably be compulsory so that the boys may have a knowledge about their own surroundings and may be induced to love nature. Besides, this will give them an idea to do some useful work, and make them realise the dignity of labour.

(b) (i) Nature study lessons with practicals outside the school room will make them more interested in agricultural work in addition to gaining knowledge in the general course offered in the school.

(ii) If financial problem is settled, it is by no means difficult to make primary education compulsory in rural areas. The main problem is that the school should be taken to the boys (and guardians) than the boys to the school.

(iii) After they get the rudiments of learning, the guardians do not find anything encouraging for their boys to attend the school any longer and so the number becomes smaller. Our school should teach something that can help the cultivators' sons directly. Introduction of nature study lessons will solve the problem.

QUESTION 24.—ATTRACTING CAPITAL.—(a) Steps to be taken are—

- (1) Departmental activities should turn towards the cause of middle-class and capitalist farming. The educated should be taught to take up agriculture as business.
- (2) Model farm should be started on profitable basis to demonstrate the feasibility of such enterprises.
- (3) Introduction of power farming will reduce the labour difficulty, which dissuades many from starting such an industry.

(b) Discouraging factors—

- (1) Owners of agricultural land remain satisfied with the little they have. They do not know anything better.
- (2) Labour difficulty is very keen.
- (3) Absentee ownership is a failure in many cases.
- (4) No certainty of getting a satisfactory return of the investment.
- (5) Lack of knowledge in growing a successful crop.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) There should be an organisation like the Social Service League of Bengal. It should have its branch in remote villages and of the district. Itinerant lecturers and demonstrators should visit them from time to time and offer illustrated talks which should be both entertaining and instructive to all men, women and children. Government should patronise such an organisation.

Desha Bandhu Das's village reconstruction work is also an organisation on the same line.

The Ramkrishna Mission (*Sevasram*) is also another great philanthropic organisation to serve the cause of the common people.

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The modern cultivator has some needs of his own, viz., social, economic, religious, educational and political. Attempt should be made to offer him help to attain them.

(b) So far as the present status of the villagers is concerned, any such economic survey will produce little or no result. We know the disease, but there is no remedy to offer.

QUESTION 26.—STATISTICS.—These are surely required in a Province that has advanced a great deal in its agricultural activities while for Assam, where the agricultural people are not yet organised, they will hardly be of any use.

Oral Evidence.

25813. *The Chairman*: Dr. Mitra, you are Economic Botanist to the Government of Assam?—Yes.

25814. You put in a note of evidence which you desire to give to the Commission? Do you wish to make any statement at this stage?—I just want to offer a plea on behalf of our department, that is, the Department of Agriculture. It is this; we want a separate department for ourselves. There should be a separate Department of Agriculture under an expert; if the finances of the Province do not permit that, we want at least that the Department of Agriculture should be amalgamated with the Veterinary Department.

25815. I should like to ask you first on the general question of research, whether you think there is that degree of co-ordination and touch between the Provinces that one would wish to see?—Yes; I do; and at present we are having occasionally some help from the Pusa Institute.

25816. And you are satisfied with the assistance that Pusa is giving?—No.

25817. You are not?—No; because they cannot help us in every way. We ought to have our own men to carry out the work. They may send us their men now and then but unless we have our own experts it is not possible to do anything here. Here I am the only expert in charge of Chemistry, Entomology and my own section, Botany. We have no Mycological Assistant in this Province. There is a good demand for all these experts.

25818. So that you think Pusa might devote its attention to problems of a fundamental and general character but that you must have in each Province a complete provincial organisation in order to apply the results of those enquiries to local conditions; is that your idea?—Yes; I may give the example of potato blight. We had the Imperial Mycologist here on several occasions. Even last year he came here and stayed for three days and planned out the work; but as we have no Mycological Assistant here, it is not possible for us to do anything.

25819. Would you tell the Commission about one or two of the principal problems of research on which you yourself are engaged at this moment?—At present my main work is rice-breeding; it is conducted at the Karimganj farm; we have also another farm at Titabar opened only two years ago.

25820. Rice-breeding is a general experiment. What particular problems are you engaged on?—Our main work here is selection work which is being conducted for the last twelve years on the Karimganj farm; but since 1921 when I was appointed, I began cross-breeding work.

25821. What particular qualities are you trying to evolve in your rice?—At present we are not looking for quality; we are only looking for quantity.

25822. What particular object have you in view in your crossing work?—We are trying to find out high-yielding varieties. We find difficulty in every way because the varieties which have been selected at the Karimganj farm are not always suitable to this valley.

25823. What other problems are you engaged on at the moment?—We have been trying experiments on the root system of rice, seed testing, transpiration, and the water requirements of rice; there are also other minor experiments that I have been continuing.

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25824. You are doing some work on transpiration, are you?—I did, but unfortunately owing to lack of funds, I could not continue that.

25825. *Prof. Ganguly*: Have you published the result of that experiment?—I have up to date sent the result of the variations of yield of rice that we have been growing here; that was published in the *Indian Agricultural Journal*. There is another paper which is in print; that is on seed testing; I have already seen the proof. There is another note I sent on the sampling of rice.

25826. I am referring to your work on transpiration?—No, I could not be successful because I could not get enough money to get some of the appliances that I needed.

25827. *The Chairman*: Then I noticed in one report that has been placed before the Commission that a series of specific gravity tests has been carried out?—Yes, I continued that experiment for four years; up to date I have not been able to get any better result. I think this was also done in Burma, and they also, in their report I find, could not get any good results out of it.

25828. Do you attach particular importance to that problem in this Province?—Of course experiments in specific gravity as to wheat were successful in foreign countries, but here I have not been successful up to date, but I am still continuing.

25829. Are you familiar with the work being carried out on these particular problems that you have mentioned in the Presidencies of Bengal and Madras?—Not quite in Madras; I am well acquainted with the Bengal work.

25830. You are thoroughly familiar with the work being carried on in Bengal?—Yes, because before I came here this pure line selection work was planned out by Dr. Hector of Bengal, and I have been following the same principle with, of course, a little change here and there.

25831. How long ago was that work planned?—Before I came.

25832. How long have you been here?—About six years; I was appointed in February 1921.

25833. Has the time come, do you think, to do any fresh planning?—Yes, I think so. If we want to do something in research, we must have better appliances. Unfortunately, I am handicapped for want of funds and assistants so that I cannot do any effective research.

25834. Will you tell the Commission your own technical training?—I graduated in the University of California in 1915; I received my Master's degree in the same University; I then did two years' post-graduate work there. Later on I got a Research Fellowship at the Ohio State University in 1918. There I did post-graduate work for two years, and I had conferred upon me the degree of Doctor of Philosophy there from the Department of Botany. After that I worked for seven months in the Agricultural and Technical College, North Carolina, as Instructor of Science, when I was appointed to this post.

25835. Have you ever been to Pusa?—Yes, once, in 1922.

25836. Did you visit Pusa about some particular problem, or just to see the Institution?—I went there in connection with the Agricultural Board.

25837. Will you turn to page 80 of your note? Under the heading Horticulture, you say, "Orange is the most important fruit industry in Assam. Skilled workers to improve the cultural, manurial, handling and marketing problems are wanting." What do you mean by the handling problem?—I mean picking, packing and marketing.

25838. This Commission has already been told in evidence that there is no such thing as picking at this moment?—No.

25839. Is it your view that the price of the orange would carry the cost of packing?—The point is that through rough handling we are losing about 30 per cent of the produce before it reaches the market.

25840. You mean through the fruit being bruised?—Yes, and they are damaged by mould on their way.

25841. What is the method of picking in the Province?—Here in the villages they sometimes use a bamboo pole to strike the fruit down. In some places I have seen men picking with bags and a ladder; that, of course, is the best way, but it is not always practised.

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25812. *Dr. Hyder* : Are the orange trees strong trees?—Of course orange trees are strong, but this hard handling bruises the fruit very badly and they are spoilt at once.

25813. *The Chairman* : On page 91 of your answer to our Question 2 on Agricultural Education, you say, "Adult education can be popularised by starting free night schools in villages." On what do you found yourself when you give us that as your view?—Such experience as I have had in Assam. In some places private organisations have started night schools in villages where the people hear illustrated lectures. At the same time in some of the towns, especially at Jorhat, night schools have been started by a private organisation. Men whose ages range from 16 to 40 attend; they are eager to learn at least to sign their names. I think that is one of the best means of educating adult people.

25814. Is that in the hills or the plains?—In the plains.

25815. In answer to our question on Finance you say, "The Government of India may start a campaign to raise money as agricultural loan, like the War loan". Do you distinguish between a loan raised like the War loan and a loan which is not a War loan. I do not quite see what you mean?—I mean to say this, the country is awake to the necessity; it is the demand of 90 per cent of the people in India, so that we might have a loan campaign by the Central Government just as we have had for the War. Then we could distribute the money so obtained all round the Provinces as need arose and thus help the farmers.

25816. That is a very picturesque way of financing the movement but it does not deal with the rate of interest, which is what I want to hear about. Do you suggest you could get money more cheaply in that way than you could through the ordinary channels?—I think everybody is awake to this, especially the educated classes, and I think there is every reason to think we should get help both at home and abroad; I am convinced of that.

25817. Are you carrying out any experimental work in connection with potatoes at the moment?—No, but in 1922, when I came here, I found that the most important problem we had to deal with was the storage of potatoes, so I started this storage experiment; but for want of an assistant I had to give it up. Another experiment I tried was to obtain a resistant variety by pure line selection of potatoes, but I found that without any help (as there is only one Farm Manager at Upper Shillong farm, he could not possibly help me very much) I am sorry to say I had to give that up too.

25818. Are you satisfied with the way potatoes are stored at Shillong farm now?—I am not.

25819. What is your ideal in the matter of storing potatoes?—I should be glad to distribute a smaller quantity of seed and try to get the seed from reliable sources, especially from the farmers whom we have supplied with our seed. We will get these seeds from a known source. At the same time, as blight is an important factor in relation to transport, I would suggest, and I have already suggested since 1921, treating the seed with copper sulphate, at least, before sending it out.

25850. What do you think ought to be the physical arrangements for storing potatoes?—In Shillong, underground storage would do very well.

25851. Do you mean pit storage?—Yes.

25852. Are you satisfied with the present storage in the shed?—The main requirements for storage are darkness, plenty of ventilation and a dry atmosphere; but those three requirements are not satisfied in the way in which we are keeping them at present.

25853. Would you fill up your trays to 4, 5, 6 inches or a foot? How much do you think would be safe?—If we keep them a foot deep, that does not make any difference provided we can get the right atmosphere.

25854. You do not mind their being stored a foot deep?—I do not think it will do any harm provided we get a proper place for storing them.

25855. Under the heading Implements you say on page 95, "Assam has really a demand for improved implements and power cultivation." What makes you think there is a demand for improved implements and power cultivation?—In this case I had in mind the middle-class cultivators. I believe that unless educated men take up agriculture as a business, it is not possible to improve agriculture in India.

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25850. I am sure that is true, but I want to know who the cultivators are who demand improved implements and power cultivation at this moment?—At present we have some middle-class cultivators who are working with motor tractors, and they are looking forward to better implements.

25851. Where are their holdings situated?—They are mostly in Assam Valley, and there are some in the Surma Valley.

25852. Do you think there is an opening for the development of the fruit-growing industry in the hills?—Yes.

25853. Is there a tradition of fruit-growing among the hill tribes?—Yes; the native home of the orange is perhaps in the Khasi Hills.

25854. For instance, is anything known about root pruning; is that recognised at all?—They do not do any sort of pruning here at present.

25855. What does their tradition of horticulture consist of?—They clear a line on a slope, then grow seedlings and then drill the seedlings in. It is the natural flow of water from the upper side that gives them the crop. The rocks being calcareous, oranges grow well in the Khasi Hills.

25856. Sir James MacKenna: Apart from provincial work, do you consider there is room for a central organisation to assist the work of the Provinces either with men or with money?—I have said in my note that the Central Government might have a sub-station in every Province and send out men to tackle the problems which the Provincial Governments are not able to take up.

25857. What problems would you suggest for such a station in Assam?—I do not mean a large station; I mean a sub-station.

25858. Yes, a sub-station?—At present we have no Mycological Assistant. Assam needs a Mycological Assistant; if there were a sub-station, the Imperial Mycologist could come here and help us.

25859. You have your own Mycologist?—No.

25860. If you have this sub-station you will want a Mycologist of your own?—We are trying to get a Mycological Assistant for the Province.

25861. How would that central organisation assist your work?—Supposing we want to tackle a special quality of rice, for instance, the protein content, we do not know anything about the quality of our rice. I would like to have an Imperial Botanist to lead us in that.

25862. Do you think, apart from the central organisation, a conference at regular periods of workers on rice would be useful, say workers from Bengal, Assam, Madras and the Central Provinces?—Yes; that would help us undoubtedly.

25863. Prof. Ganguly: You said you were the only scientific officer in the department?—I am the only one who is tackling experiment and research, but the Deputy Director is also a scientific officer.

25864. You have two Botanical Assistants; what are their qualifications?—One of them is a graduate of the Sabour College. The other one read for three years in the Nagpur College, but unfortunately he could not appear for the examination and could not therefore get a certificate.

25865. Are you satisfied with their work?—Yes.

25866. They assist you in your breeding work?—Yes.

25867. They do not tackle problems independently?—No; they do not.

25868. What are the qualifications of the Chemical Assistant?—He is a graduate of Calcutta University, and he has been six years in the Tocklai farm.

25869. What problems is he tackling?—He is doing routine work, and he will test the juice of the sugarcane we grow. Apart from that we have asked him to make a soil survey of the Jorhat sub-division.

25870. At present he is analysing the juice content of the sugarcane?—Not at present. Sugarcane work will begin shortly.

25871. What work does he do at present?—He will begin sugarcane work shortly. He is now engaged on a soil survey in Jorhat. I am particularly interested in the acidity of the soils, because that is a problem which Mr. Meggitt handled when he was here. Two memoirs on that problem have been issued by the Agricultural Department.

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25878. This Chemical Assistant is then carrying on the work commenced by Mr. Meggitt?—No. When Mr. Meggitt was here he had no assistant; he worked himself. This assistant was appointed in 1923 when I was in charge.

25879. I want to get from you what work the Chemical Assistant is actually doing now?—He is doing soil survey work and routine work, and he will shortly take up sugarcane work.

25880. He has already commenced soil survey work?—Yes; he has already commenced it.

25881. That is near about Jorhat?—In Jorhat sub-division.

25882. What are the duties of the Entomological Assistant?—His duty is to go round and train our staff in regard to remedies for diseases.

25883. Is he collecting any insects?—He has collected insects, and we have in our laboratory almost all the common insect pests of Assam.

25884. Does he study the life-history of any pests?—It is really a pity that he cannot take up any research work.

25885. *The Chairman*: Is it within your knowledge that coconut palms in the Province are being attacked by some pest?—Excuse me; it is the arecanut palm which is suffering badly in the Sylhet district. The coconut palms of this valley (Assam Valley) are attacked by a butterfly larva which does considerable damage.

25886. One witness who appeared before us was of the opinion that the department was not doing anything for the coconut palm?—Coconut is not an important problem here; it is important in Lower Bengal. The arecanut palm is important in Sylhet, and it is subject to bud-rot and root-rot. It is for this reason that the Imperial Mycologist came here in 1923. I also saw one of his assistants once during the last five years who studied the question of the arecanut palm disease.

25887. *Prof. Gangulee*: In the note you have given us you constantly speak of the soil being distinctly acid, but you do not give us any published data?—We have some. Recently we have published a little bulletin on acidity of soils.

25888. You have given there the pH. value of the different types of soils?—We have analysed a good number of them in regard to the pH. value.

25889. And the lime requirements?—We have published separate bulletins about lime requirements.

25890. Is this phenomenon of acidity important throughout the Province?—It is very important in the Assam Valley.

25891. Not in the Surma Valley?—In the Surma Valley all the rice fields are distinctly acid.

25892. You mention once or twice about failure of crops. Do you know whether the failure is sometimes due to acid?—We have tried an experiment at Jorhat and found it to be so, we tried *rabi* crops, and lime application gave us good results in all the *rabi* crops.

25893. So much for the chemical aspect of the work. What is your own work? You say your work is divided into two groups, pure line selection and cross-breeding. With regard to pure line selection you say you have two varieties of rice?—We have already given out five selected varieties.

25894. The two successful varieties of paddy are *lati sail* and *murali aus*?—These two were given out before I came in.

25895. Since you came in, you have given out three more varieties?—Since I came in, one, *fine aus* or *basmati*, and another *birpak (aus)*. I have a few more selected varieties which are also going to be recommended.

25896. This *lati sail* is grown only in the Surma Valley?—Not only in the Surma Valley, but it is successful in Assam also.

25897. Have you compared *lati sail* with other rices?—I have collected rice not only from India but also from abroad.

25898. The result of pure line selection is that you have one variety of *lati sail* and one of *aus*?—We have *lati sail*, *Georup sail*, *murali (aus)*, *basmati (fine aus)* and *birpak (aus)*.

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25899. The result of your six years' work is *basmati* (fine *aus*) and *birpak* (*asra*). With regard to cross-breeding at what stage are you now?—I am in the fifth year generation. I have got two varieties that have already been tried on the experimental farm; they will be distributed this year to other farms and also to demonstration plots for comparison.

25900. What are your crosses?—Between *George sail* and *lati sail*.

25901. Now, of the two lines of work, pure line selection and cross-breeding, which do you think is more promising?—In pure line selection we get early results, and that was why it was taken up. Cross-breeding is a long process. It takes about six years to get a real type.

25902. You are now at F_5 . Will you get results in F_5 ?—We have selected two varieties from the fourth year (last year) and we have found they are superior to the rest; next year we will compare them on a field scale and also in demonstration plots.

25903. What are the indications of the prospects of F_5 ? Do you find any definite improvement?—There is a definite improvement in yield.

25904. You are undoubtedly familiar with the work of cross-breeding elsewhere. Has any marked improvement been effected by cross-breeding in any part of India?—From Madras they have given out two; from Dacca they have given out one; I am not sure whether they have given out a second.

25905. You are definite that these are the results of cross-breeding?—Yes.

25906. Have they done anything in Burma?—I do not think I have noticed any.

25907. You said that Dr. Hector planned the work?—Yes, pure line selection work.

25908. Not cross-breeding work?—No.

25909. Cross-breeding was started by you?—Yes.

25910. Have you consulted Dr. Hector?—I have been to Dacca six times since I came here.

25911. You are in touch with him?—I am.

25912. You are not familiar with the Madras work?—I am familiar with Dr. Parnell's work, but I have had no correspondence with him.

25913. You are familiar with the literature on the work that has been carried out?—Yes.

25914. With regard to the researches that can be taken up, you are suggesting by-products of oranges. What are they?—There is a large quantity of oranges that is wasted now. If this can be taken up both on a cottage industry scale and on a commercial scale, then I think there will be a good deal of improvement.

25915. Do you take part in propaganda or demonstration work?—I do whenever I get any chances, especially in agricultural shows, and in delivering lectures.

25916. You say here "Cultivators must be given to understand that no extra tax will be levied by growing a better crop through the advice of the experts." What do you really mean by that? Are the cultivators afraid of any extra tax?—When our Inspectors and Demonstrators go to any place and ask the cultivators to take our seeds, they have some suspicion about it. They feel that if they take up the new seeds which we are distributing and grow better crops, the rents might be increased.

25917. You also say here "Demonstration will be much more effective if some *bona fide* cultivators are supplied with seeds and commercial fertilisers free of cost or at least at concession rates. They will then have an incentive to use them to advantage." Are you aware of the fact that experience gained in other Provinces in India tends to prove that improved strains of seeds given free of cost to the cultivators are not appreciated?—I think, in our case, if it is given free to the cultivators, they will take it up.

25918. You think so?—I think so.

25919. Have you made an effort in that direction?—Nothing has been done in that direction.

25920. You have no experience to go by?—No.

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25921. Have you developed any system of crop rotation either for the Surma Valley or for the Assam Valley?—In the Surma Valley, we have not done anything, but in the Assam Valley, we have a system of rotation that we have found to be very useful in sugarcane cultivation; I have mentioned it in my note, and I have suggested that that is for the average highland tract. For the average lowland tract, where rice is grown there may be some sort of rotation, but we have not been able to do anything on that line yet.

25922. Are the cultivators taking to your system of rotation?—I am not aware how far they have taken it up; in the Surma Valley, the people have some sort of rotation, because they grow two crops in many places.

25923. With regard to soils, you say, "At Jorhat, the experimental plots produced excellent sugarcane when they were under the supervision of the Chemist four years ago, while the same plots have now deteriorated and produce poor canes." Have you ascertained the causes of this deterioration?—It is a question of soil analysis and planning out the work properly.

25924. You have not enquired into the detailed process of the deterioration of the canes?—Of course, I know the processes in some places, but it was beyond my power to control them.

25925. I am not talking of controlling; have you determined the causes which led to this deterioration?—In some places the land was over-limed; in some places there was an over dose of phosphatic manure.

25926. You are definitely of that opinion?—I got it from the analysis of the Chemical Assistant.

25927. You say, "The people of Sibsagar, which is known to be a well-known productive rice-growing district, applied to the Settlement Officer, Sibsagar, a year ago to reduce their tax because they cannot produce good crops nowadays as they did a score of years ago." That shows that the deterioration goes on; have you ascertained the causes of that?—I received this information from the Settlement Officer; he wrote to me about the causes of it, but we have not been able to take it up at all.

25928. What are the causes of the deterioration throughout the Province?—To my mind, it is the continuation of one crop without the application of any extra manures or fertilisers.

25929. You say that there are vast tracts of swamp land in Assam; have you any suggestion how they could be utilised?—They could be plotted out and given to the cultivators free; Government might undertake reclamation work and have an officer to deal with that.

25930. On the question of the welfare of the rural population, you say, "There should be an organisation like the Social Service League of Bengal." Are you familiar with the Social Service League of Bengal?—I am partly familiar with the Bengal Social Service League, but I am familiar with the Social Service work in Sylhet; that work has been started since I came.

25931. Do you know if they are working in village areas or in urban areas?—They are working even in the villages.

25932. Is the work done intensively?—As far as their finances allow them to do it.

25933. *Mr. Calvert*: Are you doing any work on grasses?—No.

25934. Do you not think that there is great scope in Assam for rural pastures?—I do.

25935. What is the obstacle in the way of taking up this question of pastures in Assam?—Of course, it leads to something beyond my jurisdiction. I have not done anything on that line, but I have given a few suggestions in my note. As to the control of the pasture land, I have nothing to suggest.

25936. Is there no scope for making better cultivated pastures as in England?—I wish the people would realise the necessity of it, but they do not do anything here; if our work is organised, we can encourage the people to have regular pasturage.

25937. But is not the selection of good grasses in your own sphere?—That is perfectly true, but if we can make them grow fodder crops, that would settle the question.

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25938. You suggest that Government should assist in the problem of extracting alcohol from potatoes; is that suggestion based on any experience?—There is a large amount of surplus potatoes in the Khasi Hills this year, about 50,000 maunds, which are selling at a very low price. As my Director has mentioned, they are sold at Rs. 1-8-0 per maund, and this is a sheer loss to the people; it does not repay them even half of the cost that they have already incurred. I think if there were any possibility of starting some work on that line, the industry would develop.

25939. Do you think alcohol could be produced at a price which would compete with other fuels?—This alcohol will not be used for fuel at all; we have no other source of alcohol here; we cannot produce any alcohol in this part of the country, and this could be made into methylated spirit very easily.

25940. Would there be any demand for methylated spirit?—There is great demand for it; it costs as much as 12 annas a bottle.

25941. It can be used as fuel?—It can be used in drug stores, for lamps, stoves and other things.

25942. That is for burning; could it compete in price with other sources of fuel, such as ordinary kerosene oil?—I think the demand for alcohol is quite different from the demand for kerosene oil. As for the question that you ask me concerning comparative prices, I can say nothing about it because we have never tried it.

25943. Is it a question of using potato alcohol in place of petrol for motor cars?—I had no idea of that.

25944. Mr. Kamat : We are told that the revenues of this Province could not afford a separate Department of Agriculture. I want to know whether you have gone further into this question, just to prove that the Province can afford it?—I have taken it up; as I have already stated, I do not want a complete separation if our finances do not permit it, but I want an amalgamation of the Agricultural and Veterinary Departments. I think you know that our Veterinary Department is separate, and Agriculture is amalgamated with Industries and the Co-operative Department. My suggestion is that the Agriculture and Veterinary Departments should be amalgamated together, and Co-operation and Industries may be a separate department by itself; in that case Government will not have to spend a single pie extra.

25945. That is a separate question altogether; you wanted to have a separate Department of Agriculture?—If possible.

25946. That is your first choice?—Yes.

25947. Now, you say that if the Department of Agriculture and Veterinary Department are combined together and the Co-operative and Industries Departments are amalgamated, there will not be any extra cost to Government?—Yes, there will be no extra cost to Government, because there will be only two Heads of Departments as at present.

25948. I do not quite follow why there will be no extra cost to Government under your arrangement?—At present there are two Heads; one is the Veterinary Adviser, and the other is the Director of Agriculture, Industries and Co-operation. According to my suggestion, the Veterinary and Agricultural Departments should be under one Head, and Industries and Co-operation should be under another Head.

25949. You have not explained what I wanted; do you mean to say that the Director of Agriculture should be a veterinary officer, to man the two posts on one salary?—He may have some allowance for it.

25950. You have at present a Director of Agriculture who is a non-scientific man?—Yes.

25951. And your suggestion is that the Veterinary Advisership and the Directorship of Agriculture should be one combined post, the incumbent drawing one consolidated salary?—Yes.

25952. It naturally follows that the Director of Agriculture must have knowledge of veterinary subjects?—It is an allied subject.

25953. Your arrangement, therefore, involves a man who combines a knowledge of agriculture and veterinary science?—It is not quite necessary. Under the present arrangements, the Director of Industries who is also the Director of Agriculture is not even an expert in agriculture, but in the

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other case, when the Agricultural and Veterinary Departments are combined, an expert agricultural officer will have at least some knowledge of veterinary science.

25954. So, that is a pre-requisite to make your arrangement workable; otherwise it is not possible?—It may not be a pre-requisite, but it is understood that the agricultural officer knows at least something about cattle.

25955. Do you think knowing something about cattle would be quite enough to run a Veterinary Department?—Of course, he may not be an expert, but the combination would work better in our case.

25956. I do not think you quite follow. What is necessary is that the Veterinary Department must have a man who knows the science of veterinary subjects?—Quite so.

25957. And if you want to save expenditure by combining the two posts in one man, that one officer must be both a scientific expert in veterinary subjects and a scientific expert in agriculture; otherwise, your scheme does not succeed?—In our case, if the Veterinary Department is combined with the Agricultural Department, there must be a Deputy Director for the veterinary side, who will be able to advise the Director in every way.

25958. Does it not increase the cost?—There is sanction already for a Deputy Director for the Veterinary Department.

I do not think you have been able to prove that, within the amount you are now likely to get from the revenues, you could re-adjust the existing arrangements.

25959. With reference to your suggestion to have an Orange Growers' Association, you say that if there is such an association the orange growers will get four times the profit; is that correct?—Yes.

25960. Have you attempted to form an Orange Growers' Association?—No.

25961. Which department should take the initiative in your opinion?—In this case it should come either from the Agricultural Department or the Co-operative Department.

25962. But both these departments are combined in one in this Province to-day?—Yes.

25963. Then why has not initiative been taken?—Nothing has been done; that is all I can say.

25964. Then about subsidiary industries; I think there are industries which your department itself can initiate. Take, for instance, the industry of vinegar-making; what has prevented your department from taking it up?—There are cottage industries and, at least in Assam, they come under the Industries Department.

25965. Here, again, the Director of Industries is the Director of Agriculture also?—That is true; but vinegar-making really comes under the Agricultural Department. Here in Assam it has not been taken up by the Department of Agriculture.

25966. I want to know why you have not demonstrated on a small scale that vinegar could be made?—We have not got the money to work on these lines.

25967. So in this case it is not a question of men; is it money?—I think both.

25968. You state that departmental activities should turn towards the cause of middle-class and capitalist farming and that educated people should be taught to take up agriculture as business. In order to attract the middle-class educated men, agriculture must pay. Are you quite sure that agriculture as a business pays in every case?—If it is properly done, it will pay.

25969. If that is the case, then have you taken any definite steps to attract capitalists as has been done in other countries. For instance, in South Africa people are advertising for private capitalists?—Nothing has been done but there is scope here. We have abundant areas in Assam where such capitalist farming can very well develop.

25970. It is not a question of area. I know you have got millions of acres which are practically waste land, but the question is whether it pays

as a business proposition. Supposing a man starts with a capital of Rs. 2,000 and asks for some proper land, how much can he earn per year?—I have no idea.

25971. If you have not done that, how is capital to be attracted into your Province?—We have got past experiences to rely upon.

25972. Those are very vague experiences?—There are two farms in the Kamrup district which are being run by two gentlemen farmers. They are using tractors and both of them are successful.

25973. I do not want generalisation from extreme cases of men who are using tractors; I want an average case. Have you been able to prove that if an ordinary man with small capital takes, say, 10 acres of land, he can make a decent living on an average of five years?—It has not yet been proved in Assam.

25974. Then you are stating that capital could be attracted and educated men brought in on data which have not been proved to be successful?—We find it among the few and we are hoping for its extension.

25975. What I have been trying to make out is this, that the department has not, either in the matter of subsidiary industries or in the matter of attracting capital, taken any real initiative, either by giving to the world proved data or by taking steps to demonstrate industries like vinegar-making, in showing that there is a great deal of scope for going ahead?—I agree with that.

25976. *Rai Bahadur R. M. Das*: Are you carrying on any experiments in deep water paddy or boro paddy?—No.

25977. Do you not consider that these two crops are very important for the Surma Valley?—They are very important in some places.

25978. Then why are you not taking them up?—We have not got funds to start suitable farms to carry on that sort of work.

25979. You told us something about the social service work. Do you know that the Sylhet Social Service League is working among the rural population in the district?—Yes; I know the men who have been working it. Of course, it was started only since I came here and we have worked together in some places at agricultural shows.

25980. Did you present some agricultural slides to this League?—I did; they were my own slides that I brought from the States.

25981. Do you know that these lectures are very much appreciated and are very popular among the cultivators?—I have found all round Assam that wherever I have lectured the cultivators have appreciated these things.

25982. Do you think that, if your department organises such lectures for the diffusion of agricultural and veterinary knowledge, it will go a great way in solving the problem of agricultural education?—I agree with you that this propaganda work will help a great deal.

25983. Do you know that the Sylhet Social Service League has started some night schools?—I have heard about it. I have never visited those schools.

25984. Are not those schools very much appreciated? Do not pupils varying in age from 16 to 40 attend them?—I have heard that people attend these schools.

25985. Do you think that if similar schools are aided by Government and if the Sylhet Social Service League is also helped by Government, they will be able to do a lot for the welfare of the rural population?—Yes.

25986. *Sir Henry Lawrence*: Is it the case that the paddy growers in this Province require a very large number of varieties of paddy seeds to suit the conditions of their fields?—They do not need it, but unfortunately, they cannot avoid it. They do not need so many different varieties.

25987. You think they can carry on with one or two varieties?—If they do, they will get a better market for their crop. By having so many different varieties they are just mixing up their crops and they cannot keep them pure. Whenever we recommend them our varieties, we always ask them to keep them pure so that they may have a uniform produce.

25988. What are the results obtained on the experimental farms in the Bombay Presidency regarding rice?—I am sorry I do not remember them now.

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25989. In Madras also they have a considerable number of varieties in their farms which they distribute to different areas in accordance with their conditions; you do not agree with that policy?—I do agree with that policy; but as I have already said in answer to a question by the Chairman, we have not yet tried our recommended varieties according to the different soils that we have in both the valleys.

25990. I suppose fundamentally your problems are similar to those in the Madras and Bombay Presidencies?—They are. I had a talk with Dr. Burns, the Economic Botanist of Bombay, and I found that their work is just the same as we have been doing, namely, selection and cross-breeding.

25991. Then you are keeping yourself acquainted with the work in other Provinces?—So far as literature is concerned, yes.

25992. In answer to our Question 3, I do not understand your point about the fear of cultivators that they would have an extra tax if they grew a better crop. Is the assessment here not fixed for a number of years?—I am not in a position to answer the latter question, but as regards the former, I can say that the cultivators are illiterate people and as soon as they see an Inspector of Agriculture or a Demonstrator approaching them with these good seeds, they become afraid that if they grow a good crop their rents may be increased.

25993. You mean to say that their rents will be increased by the zamindar or by whom?—Their rents will be increased by the Government. In this Valley, there are no zamindars.

25994. I want to be quite clear on this point. Are you talking of the rents payable to the zamindar or the tax payable to Government?—I am, talking of the tax payable to Government, especially in the Assam Valley, because there are no zamindars here except in Goalpara.

25995. Are the landholders here exempt from any increase of tax due to their own improvements?—I cannot tell you anything about it.

Mr. Heslett: It is the general policy of Government not to tax the improvements of cultivators.

25996. *Sir Henry Lawrence*: Is it laid down by law?

Mr. Heslett: I do not know; Mr. Scott will be coming before us to-morrow and he will be able to say.

25997. *Sir Henry Lawrence*: On page 97 of your note regarding agricultural labour, you say that the only solution will be to allow the labourers from Bengal to work as labourers. Would you explain that point further?—What I meant to say was that here in Assam there is a dearth of labour and if there is scope for these Bengali labourers from Mymensingh to come to Assam, that will partly solve the question.

25998. Who is it that prevents the labourers from Bengal from working as labourers in Assam; is it the Government?—It is not the Government but they seldom can find a chance to come here as it is a long way off. There must be some one to take the initiative and bring them in.

25999. Do I understand your proposal to be that Government should organise some means of obtaining Bengali labourers?—I do not go so far as that. What I meant to say was that if there be any place in the Province where there is a dearth of labour, this fact may be announced to the neighbouring Province from where we can get such labour.

26000. In regard to fruit cultivation, I understand generally from your note that the main obstacle is the lack of roads and transport; is that so?—That is one of the main obstacles.

26000-a. Do you advocate that fruit areas should be improved in the matter of communications?—Yes.

26000-b. *Sir Thomas Middleton*: In your note on Agricultural Education, you say on page 90, "Except college education a separate agricultural school for the training of the boys of agriculturists will seldom be a success"; and on the next page you think that agriculture should be added to the curriculum of high schools. I am not clear as to your policy for agricultural education?—What I mean to say is that a separate agricultural school will not be favoured here. If I remember aright, a separate agricultural school in Bombay was also not favoured. As regards your next question regarding the introduction of agricultural courses, that can be done

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in a different way. If our University authorities have agriculture in their curriculum, then there can be combination in our high school courses as it is done at present.

26001. Were you a graduate before you went to California?—No.

26002. What stage had you reached when you went to California?—I had studied up to the First Arts.

26003. Do you think that the ordinary student, or even the first rate student, knows enough English to enable him to prepare himself in science subjects and also to take agriculture in his high school course?—We are doing that at present but it is really difficult; I have undergone this difficulty myself and I can quite understand that if we had a course in high school agriculture, high school physics and high school chemistry, it would facilitate the work of the college. These boys when they get through the high school and enter the college can follow the courses very easily and at the same time the teachers also will be relieved of a good deal of work.

26004. Would you agree that the teaching must be of a very high standard in the high school?—No; just elementary agriculture in the high school just as we find in foreign countries, in the United States for instance.

26005. But as judged by our standards, the class of instruction given in the high schools in the United States would be reckoned as high-grade instruction, would it not?—I admit that they have other facilities. For instance, they get instruction in their own language. In our case especially the middle-class boys seldom know anything about their surroundings; they do not know that what they eat is coming from the poor peasants; they do not realise that at all.

26006. I fear that adding agriculture to the courses in the high school would overload the already overloaded curriculum?—I do not think so, because at present in the high school in the four years—from Class VII to Class X—we have a combination of mathematics, Sanskrit and English, for example. One can go without history and geography; at the same time one can take history and geography and not Sanskrit. Thus there are many groups already and, if we add agriculture to them, it will not do any harm.

26007. You feel that if you had had an opportunity of studying agriculture at a high school, you would have gone to California better equipped?—Yes; I quite realise it.

26008. While you were studying for your doctorate were you engaged in plant-breeding work?—I did plant-breeding work in the University of California. I also specialised in horticulture and botany.

26009. While you were in California did you come across the fruit-growers' association there or hear of their work?—I have heard of their work. The biggest is the Orange Growers' Association in Los Angeles.

26010. How do they pack oranges?—They pack them in boxes as they collect them; these boxes are specially made.

26011. Do you know what timber they are made of?—They are made of pine.

26012. The same pine as is growing here?—Yes; that is why I advocate that system here.

26013. Do you keep in touch with the progress being made by the American experimental stations since the War?—Not very much at present.

26014. Do you know that they have largely extended their county work in recent years?—They have got one Agricultural Adviser in each county; he is the man who is responsible for propaganda and demonstration.

26015. Who corresponds to that person in this country?—I cannot compare him in that way because he is a graduate of the College of Agriculture.

26016. But his work is to do the work of your Demonstrator?—Quite so.

26017. And he is a graduate before he comes out as a Demonstrator?—Yes.

26018. If he is a specialist, where does he come from?—These specialists in the States come from agricultural colleges. They are quite separate from the specialists who are in the provincial stations maintained by the United States Department of Agriculture.

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26019. Who directs the work of the County Agents in the States?—The Director of Agriculture is at the head; but there is an organisation in every State over and above the propaganda work.

26020. What has been the training of the Director of Agriculture as a rule?—They are all graduates; that is all I can say; but some of them might have more than one degree.

26021. Some are specialists and some are men of the county type?—I think all of them are specialists at present.

26022. Coming to Assam, you are conducting a soil survey in your district? Do you know the work of the American soil surveyors?—I am not a chemist; but what I find is we really want a survey of our soils before we can safely recommend different crops according to the nature of the soil.

26023. Do you know that the soil surveyors employed in America are not all chemists?—They are all chemists; at the same time there are some soil physicists also who might not be chemists.

26024. These are the specialists; but the man who conducts the field survey is trained as a geologist?—I do not know that.

26025. You are troubled a great deal with acidity in the soils of Assam?—That is what I find from my chemical work.

26026. Do you know that the field surveyor in America carries with him a very simple outfit?—Yes; I have got a soil testing apparatus; I got it six months ago.

26027. What is the p.h. value of your soils in Assam, roughly, is it 4, 5 or 6?—It runs up to 8, that is, neutral on this side and on the other side it goes down. We are trying the Hopkins' method, too.

26028. I only want to get some idea of the degree of acidity of the soils described as acid; is it as low as 5?—Perhaps below that too.

26029. Coming to this question of your studies on rice, you have indicated somewhere that you think that the soils are too acid for rice. Have you done any experimental work?—I have not indicated anywhere that it is too acid for rice; but I say it is too acid for *rabi* crops.

26030. Have you studied the soil conditions under which rice can thrive?—Rice can thrive in any place; acidity of the soil has nothing to do with it. But I have found it in laboratory experiments in the Erlenmeyer flasks that it can bear alkalinity but not acidity.

26031. *Prof. Gangulee*: You said just now that acidity has nothing to do with the growth of rice?—In our experiments in the Erlenmeyer flasks it could bear alkalinity but nothing of acidity. Even .2 per cent of acidity is injurious to the seedling while it can stand more alkalinity. Of course in that case my acidity was mineral acidity.

26032. *Sir Thomas Middleton*: But you cannot tell me what the relation between the acidity of the soil and the growth of rice is?—We have not tried that. Acidity does not affect the rice as the rice soils are distinctly acid, even to litmus.

26033. You say you want to study the question of environmental influence upon the quality of rice; and I think you refer specially to the percentage of protein?—That is the main idea.

26034. Have you any information as to the variation of the protein in rice at all?—I have none; I had no one to analyse the rice samples that I had.

26035. In answer to Professor Gangulee, you said that you have got now rice in the fifth generation. You are testing it for yield. Is the fifth generation fully fixed?—No; some of them were not pure. We had fifty of them here and only two of them came out prominently.

26036. When you say not pure, what would be the percentage of the impurity in the fifth generation?—It varies a good deal in different crosses. I have not been dealing with one only. I have crosses going on for the last five years; and every year some new crosses are being added.

26037. If you have much impurity in the fifth generation, you have a good deal of work ahead?—Yes. There are some which we do not use. Some are impure and we try to find out whether we can get any better strain in that impurity.

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26039. With regard to potatoes you mention the fact that the Imperial Mycologist has visited your place and given you advice on potato blight. What is wanted in the study of potato blight here?—The only thing that is wanted is spraying; but we have not studied the nature of the attack in this place.

26039. Is it any different from the nature of the attack in every other country?—There might not be any difference but the place where we could attack this problem has not been found out here. As soon as we find the spots on the leaf, we begin to spray but that does not control all of them. If we can find out when and how to attack the problem, then of course we can do something.

26040. Could not the Mycologist tell you that? Is it not a case of trying spraying at different times with varying frequency and at different strengths?—Not only that, but even in storage.

26041. We will come to storage later on; we are now talking of the growing plant?—The actual time we know. The Imperial Mycologist will give us the time to do it; but I think if we have a Mycological Assistant of our own, he can go round and see what will be the best time to spray and so on. I wish we could have a Mycologist to work with us.

26042. On the question of storage, your potatoes rot because they have been blighted; that is the difficulty?—That is the main difficulty.

26043. You have expressed the view that it would not matter if you stored them a foot deep?—As the climate in Shillong is very cold, I do not think the depth would have much effect.

26044. Have you not seen that the potatoes stored in boxes at the Shillong farm are even now beginning to form long shoots?—They are sprouting because they are in the light.

26045. No, excuse me, it is because they are in the dark that they are sprouting so much?—Of course, that is true too in one sense; but, although we have not made any experiments on this, I do not think they would have sprouted so much had we been able to keep them in a uniform temperature and at the same time in darkness.

26046. I can tell you that if you expose them to the light it will stop the sprouting?—We have not done any work on that line yet.

26047. You suggest using copper sulphate for sprinkling the seed?—Copper sulphate and lime; Bordeaux mixture I mean.

26048. I thought you said copper sulphate?—Excuse me, I suppose I omitted the other.

26049. You talk of a pure line of potatoes; I do not know what a pure line of potatoes means?—When we get new potatoes from abroad many of them are mixed. At the same time, when we bring them here it is not possible for us to keep them pure, some of them are so badly mixed; if we can keep them pure it will serve us better.

26050. You may use the expression 'pure line' in connection with rice selection; but not in connection with your potato-growing?—That is quite true, but what I meant was just to keep them pure.

26051. You mean you want to rogue your potatoes?—That is the main thing that it is necessary for us to do.

26052. *Prof. Gangulee*: Are you familiar with the potato investigations carried in Rothamsted in England?—No, I am not.

26053. *Sir Thomas Middleton*: Can you tell me anything about the potash requirements of potatoes; have you studied that?—It is a potash-loving plant.

26054. Looking through your list of experiments with manures I found no reference to any potash experiments?—The water-lily-cinch ash was experimented with in Surma Valley on potatoes and it was successful to a certain extent; but may I tell you frankly I do not deal with this potato crop at all because that is under the Deputy Director.

26055. Yesterday I was informed that a Mycologist was wanted to study areca palm diseases, but I think you referred to-day to the fact that the coconut palm was affected by an insect?—That is not coconut palm, that is the areca palm.

26056. What are the diseases of the areca palm?—The fungus disease.

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26057. Both are fungus diseases?—I am not sure about the root-rot of the areca palm, whether it is fungus or not.

26058. *Mr. Hazlett* : You think it is not a good thing to amalgamate the organisation of co-operative credit and agriculture. Most people seem to think it is a very good thing, especially in a small Province like this. There was some ill-feeling between the officers of the two departments before they were put under one Head. Now they are under one Head; do you not think the amalgamation is rather a good thing on the whole in the present circumstances of the Province?—I really cannot agree with you on that point. At present our Director has got these three departments and the work is very heavy; it is too much for him; but if agriculture and co-operation are combined, he might still be relieved of some of the work. If we are to see a real development of agricultural research and experiments, we require a Head well acquainted with those researches and experiments.

26059. It was suggested as a matter of fact three years ago that there should be a separate technical officer, but then times being bad, and Mr. Birt retiring on account of ill-health, the whole scheme fell through?—Yes.

26060. So that since then, in view of straitened finances and for other reasons, we have had to carry on as at present?—We need experts, we need a laboratory to carry on experiments and research. If we had an expert for those two departments, I think we should be better off than we should be with these three departments combined as they are to-day.

(The witness withdrew.)

**Mr. DIJESH CHANDRA CHAKRAVARTY, M.A.,
B.L., Dewan, Gauripur Raj Estate, Assam.**

Replies to the Questionnaire.

QUESTION 1—RESEARCH.—(a) (i) I think that provincial research organisations should be abolished and a central research institution for all-India, equipped with up-to-date laboratories and experts should be established under the supervision of the Government of India. All cases for research might be referred by provincial officers to the central institution and the result of such examinations communicated to the Provinces, who could work upon the advice given. Demonstrations should be made in Provinces based on those results.

Indigenous theories and traditional local methods represent the accumulated wisdom of generations and the existing practices should not be discarded without careful examination.

(ii) *Veterinary research*.—Local cattle are gradually deteriorating—both draught and milch cows. Cultivators largely depend upon imported draught cattle which they buy at large prices but they seldom keep well in this part of the country. Improvement of local cattle has not been seriously handled.

(b) As far as I am aware, there are no up-to-date laboratories for carrying on agricultural research or veterinary research in this Province and neither agriculture nor veterinary subjects have been seriously tackled.

I might mention the case of coconut trees. Since the last seven or eight years, a very large number of coconut trees have died. In several places, betel-nut trees have also been similarly affected. These trees are very lucrative in these parts and the local people derive a very large income from betel-nut trees and the attention of the Agricultural Department should have been directed to this to eradicate the blight.

(c) I would suggest that research might be made with a view to introduce new lucrative crops other than those which are usually grown by local men, e.g., linseed, *nigella indica* (*kalajira*), *ojowan*, pepper and potato, *patol*, etc. The ryots from Bengal who are settling in these parts already grow many of them but unfortunately the local people do not take to these and I think they should be induced to adopt these special crops after it has been found by research and experiment which of these would grow well in these parts.

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QUESTION 2—AGRICULTURAL EDUCATION.—There are no institutions for a comprehensive agricultural education in this Province. Pupils used to be trained in the Jorhat farm before but that also is being gradually discontinued, and the instruction given before was not in any sense full.

(i) No.

(ii) Everywhere, I should think. As for my district of Goalpara, the need of agricultural education is of the foremost importance. In my part of the district, ordinarily the conditions are complex as besides the normal soil of the district, there are *chur* areas and certain areas which sank during the earthquake of 1897 and are yet lying waste. The problems are different in these three areas which require separate consideration. This matter was brought to the notice of the Agricultural Department and although local enquiry was made for two days, I am not convinced that sufficient attention and care were given to the subject.

(iii) Yes, if there are qualified and willing men: but I would not confine this to agriculturists only.

(iv) If improvements are demonstrated in rural areas as the result of scientific methods in agriculture, the demand for instruction might be stimulated; service would be another attraction.

(v) If agriculture could be shown to be a lucrative vocation, young lads might seriously think of adopting it.

(vi) There are no institutions.

(x) See (v) above.

(xii) If agricultural education dealing with local crops, etc., and care of cattle, a little survey and accounts be included in the instruction to adults they are likely to take more interest than in the purely school curriculum. Special books should be written for their education. Efficient and tactful teachers are absolutely necessary for the education of adults. Popular religious books should also be added.

(xiii) (a) Agricultural education is of the most vital importance in a country like India and I think that Government has not given the amount of attention to the subject which its importance demands. The result has been that while other agricultural countries, such as Japan, are daily improving their agricultural methods thereby enriching their peasantry, Indian ryots are growing poorer and poorer. Agriculture must form an important branch in the course of instructions from the primary to the secondary schools leading to higher education with agricultural degrees.

To effect this, I would bring the Agricultural Department under the Education Department and in fact amalgamate the two. In the present Agricultural Department, the highest post is occupied by a Director who is not an expert on the subject. From the next post, viz., that of Deputy Director of Agriculture, all are experts with special education in the subject.

In all secondary schools, there should be agricultural teachers for instruction in those subjects, just as we have the science course men for mathematics, etc. From the middle English and middle vernacular schools to the primary schools, I would have the teachers specially trained in agriculture and put the duties of teachers and Agricultural Demonstrators on the same man thus doing away with the subordinate staff of the Agricultural Department. The inspecting staff of both the departments should be amalgamated and they should gradually be recruited from agricultural graduates. The existing school *pundits* could be trained in agriculture in the Normal Training School, where expert agricultural teachers should impart education to the *pundits*. In this way, the duplication of staff will be avoided as well as dual control over the same school. The demonstrator-*pundits* would carry on demonstrations in the localities as now, according to the directions of expert supervising officers.

It would, of course, be necessary to have special expert agricultural officers for research and practical experiments and for supervisions. They can also act under the Director of Public Instruction who would be the principal administrative head under the Governor and his Minister. The details, I think, could be satisfactorily worked out. I think under the present circumstances this would be a practicable scheme. One or two institutions for agricultural education alone would not meet the demand and the poor agriculturists will not be able to take advantage of such institutions. Such schools for higher agricultural education might be started,

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but agriculture, I think, should form an important subject in the ordinary curriculum of instruction beginning from the primary schools attended with practical classes fitted to the ages of the students. These subjects should be compulsory up to say the third class of secondary schools after which this subject may not be taken up by those who intend to have general education on other subjects.

One great mischief which is resulting from the boys of the agricultural classes joining the ordinary schools is that as soon as they come in contact with the *bhadralog* boys, they begin to look upon agriculture as a degraded vocation. The *bhadralog* boys in their turn are used to look down upon agriculturists. If, however, both classes are taught agriculture from the primary schools and made to take part in practical methods of agriculture from the beginning, this mistaken view will disappear and both classes would learn to value the dignity of labour.

It may not be possible to have demonstration plots connected with town schools.

(b) If the Education and the Agricultural Departments were amalgamated, there would be considerable saving. It would be possible for the teachers to be better paid.

Finance.—It is difficult to say how Government could meet this expenditure, but I would press that Government should retrench in other departments to make liberal grants for agricultural research and education. I am not competent to suggest how this is to be done but it is certain that, for India, agriculture is a most important subject and improvement in this direction should not be retarded for want of funds. It is also true that nothing can be done unless there are adequate funds and so the necessary money should be found, even if extensive retrenchments have to be made in other subjects.

QUESTION 3—DEMONSTRATION AND PROPAGANDA.—(a) Demonstrations on the plots of lands belonging to intelligent and knowledgeable cultivators in rural areas: but much more remains to be done.

(b) When a successful crop is harvested, the adjoining villagers should be brought to the spot and the result shown to them.

Prizes and recognition in other ways by Government and zamindars would also be appreciated.

(c) Expert advice must be backed by successful demonstration in plots in rural areas. Agriculturists are, as a rule, very conservative but if they are shown that there is a larger yield or a better class production by using improved seeds or new manures, resulting in larger profit, they will be quick to adopt such expert advice.

(d) I do not know if it would be pertinent to this question, but I can mention one instance which occurred two years ago, after a severe flood in some parts of this estate. I asked the Agricultural Department for a large quantity of paddy seeds for loan to tenants to enable them to try a new crop in places where the existing crops had been destroyed by floods. The seeds were supplied and paid for by this estate and distributed amongst the ryots. In many areas the seeds did not germinate but the Agricultural Department did not refund the price which had to be borne by this estate. The result is that the ryots lose confidence on seeds supplied by the Agricultural Department and it will now take years to restore the confidence thus lost. This is of course due to the department's having no seed stores.

QUESTION 4—ADMINISTRATION.—(a) For the purpose of economy and efficiency, I have stated at the outset that the research institution for agriculture should be under the direct control of the Government of India and I think provincial laboratories and staff might be altogether done away with.

(c) No.

(i) A beginning has only been made and much remains to be done.

(ii) There are very few railways and none in the east bank of the Brahmaputra in this district.

(iii) Roads are few and there are large tracts without a single road. This is a flood-ridden district and all trunk roads ought to be above flood level and bridges over waterways have to be constructed. At present, even important trunk roads are without bridges, and when roads are made,

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sufficient waterways are not kept with the result that areas become water-logged or the roads are annually breached. I have seen jute selling at Rs. 2 per maund below current prices within two miles of markets, for want of roads.

(iv) As the Meteorological Department now claim to be able to give accurate forecasts about rainfall, etc., it would be a real benefit to agriculturists if these reports are communicated to rural areas. The reports should be widely circulated in vernaculars.

(v) There are very few post offices now. The Postal Department would not open a new post office unless the income meets their cost. This rule should be discontinued in case of experimental post offices.

(vi) In this estate there are only three telegraph offices and seven post offices in an area of 60 square miles.

QUESTION 5.—FINANCE.—(a) This is a most important thing without which any substantial progress is impossible. Besides private sources, the recognised sources of finance are from the co-operative credit societies and Government agricultural loans.

As for co-operative credit societies, these institutions would require time to thrive as their success and expansion would depend upon the spread of education. Then again the most influential and moneyed people in a village—on whom depend the success of these institutions—are generally antagonistic. These societies depend upon Central Banks for their capital and are supplied with very small amounts only which are utterly inadequate for clearing the indebtedness of the area. I am not hopeful that in the present system, the co-operative societies can finance agricultural operations, unless their capital is supplemented by Government loans at a nominal interest. In every area served by a co-operative society, there are several cases of big indebtedness which must be outside the scope of such societies as they would require loans for long periods. I would limit the operation of the co-operative societies to short-term small loans and the former classes should be taken up by Government agricultural loans. The law regulating these loans should be modified and the term of repayment fixed on the facts of each case.

If, however, co-operative societies are opened for the sale of the agricultural produce of their members—thus saving the middleman's profit on behalf of the growers—and a certain percentage of this increased profit be deposited in the societies in the accounts of the members, the capital in the societies might be very largely increased.

This and Government loans, either through the co-operative societies or under existing law, modified to suit the requirements of the borrowers, could be the only sources of finance to agriculturists which they could get at a reasonable interest.

Private capital is usually shy of all Government measures and the money-lenders generally lend on very high interest. Although it is difficult even by legislation to regulate the rates of interest, I think an attempt should be made to reduce the rates of interest by legislation. This might induce people to deposit their monies in Central Banks when the latter are run on successful business lines and are able to pay reasonable dividends.

(b) I think people would readily obtain loans both under the Lands Improvement Loans Act (India Government Act XIX of 1883) and the Agricultural Loans Act (India Government Act XII of 1884) if they are given. The rules under those Acts may have to be modified but my impression, and I might add experience, are that loans under these Acts are not given by Government for want of funds.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) (1) Improvidence.

(2) Litigation—in most cases village touts are responsible for this.

(3) Failure of crops.

The ryots have gradually lost the habit of work and now employ hired labour for operations they used to do themselves.

(ii) Village moneylenders, local *mahajans*, loan offices. From villagers they also borrow paddy whose rate of interest is from 100 to 150 per cent to be repaid in kind after a few months.

(iii) Expenditure higher than income to which may be added the heavy rate of interest, and hypothecation of crops at times of need.

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(b) To increase the income of the ryots. Reduction of interest by legislation or facilitating redemption of mortgages by lending money either from land mortgage banks or under Agricultural Loans Act, may also give temporary relief.

An average poor ryot who has not enough paddy for the whole year's consumption has to borrow paddy for seeds and rice. The price of paddy seeds in villages is usually very high and varies with the demand and the interest of paddy borrowed is still higher. It would afford them relief if they can get these cheap.

(c) I would not do this.

Yes, I would do away with usufructuary mortgages in the cases of ryots.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) It would be useless to try this as the law of inheritance will gradually bring this about. This is a land of small holdings and I would rather think of introducing intensive cultivation in these small holdings.

(c) I think if these small estates are taken under the Court of Wards, much good could be done to these estates. It is a fact that estates of minors or widows are difficult to protect.

QUESTION 8.—IRRIGATION.—(a) In this district, the rainfall is sufficient and I do not think irrigation is necessary. I would not, however, say that irrigation might not improve agriculture in special areas but I think the money that may have to be spent for irrigation might be much more usefully spent in more important and pressing agricultural needs.

Parts of this district are liable to heavy floods and what we want are flood embankments which would enable ryots to reclaim large areas which are now not cultivated for damage by floods. As these areas comprise the estates of more than one zamindar, Government action is necessary for the erection of embankments and their maintenance by raising the costs from those who would benefit by them with some Government contribution where necessary.

There are also water-logged areas which could be made fit for cultivation if the water is drained out.

Dredging of silted up rivers is very important: but in this matter too Government must help with dredgers.

QUESTION 9.—SOILS.—(a) (i) It strikes me that for want of sufficient water escapes in the railway embankments, tracts of land have been made unfit for cultivation and provision for sufficient water escapes should be made compulsory during railway construction.

(iii) By planting such plants as *dhaincha* to arrest the silt and retard the force of the current.

(b) Yes, this is of yearly occurrence in the *chur* areas. What appears to be a fertile area is made absolutely barren by the deposit of sand during flood and barren areas are made rich by the deposit of silt.

The great earthquake of 1897 was responsible for entirely changing large areas in this way.

In parts which are not subject to floods, e.g., the *pargana* of Ghulla, the general complaint is that the fertility is decreasing.

(c) The problems are different in different areas. A large tract of country at the foot of the Garo Hills alongside the river Jinjram, has become unfit for cultivation from excessive flood. Embankments would protect the area against floods but unless Government takes it up, it is impossible to do anything as this would extend through several estates. Export advice is necessary for the reclamation of similar areas.

QUESTION 10.—FERTILISERS.—(a) Chemical analysis of soil could disclose how it can be enriched and fertilisers should be applied after such examination.

Plots could thus be made fit for special crops by applying special manures.

We want agricultural experts to do this for us, and advise what manures would be suitable for special crops.

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Just at present the bones of dead animals are being collected and exported to the mills. These, if utilised locally, would act as fertilisers, but they usually take a long time in natural process. I think local tenants could be taught how the bones could be quickly converted to fertilisers so that local cultivators could get full advantage of this.

(c) Demonstration after chemical analysis.

(f) Education, but I do not think the use of cowdung as fuel is excessive.

QUESTION 11.—CHOR —(a) (i) By ensuring the purity of seeds, application of suitable manure and the use of improved implements, expert advice is however sought.

(ii) It should be the duty of agricultural experts to advise the agriculturists as to which new crops might be introduced with advantage. They should first examine the soil, make experiments and then demonstrate them in plots of lands belonging to ryots.

There are several new crops, e.g., spices, vegetables, etc., which the East Bengal cultivators who have taken up lands in this district have grown with profit but the local men have not yet adopted them.

(iii) There should be seed stores in villages from which seeds could be readily purchased by the ryots. They should be given free for demonstration or lent. The Demonstrator-pundits may be in charge of the seed stores and demonstrations.

(iv) By a liberal grant of licence for guns. But the abuses should be prevented and such licences should not entitle agriculturists to use them for sport, or else it is inevitable that certain species of birds and beasts would soon become extinct.

(c) (1) Certain varieties of rice, jute and spices.

(2) Kitchen vegetables, cauliflowers, cabbages, beans, Shillong potatoes, melons, etc., have been introduced here during my time and are getting more and more popular.

QUESTION 12.—CULTIVATION —(i) & (ii) I would leave these to experts who have practical knowledge but it is certain there is ample scope.

QUESTION 13.—CHOR PROTECTION, INTERNAL AND EXTERNAL —(i) Existing measures are certainly not sufficient, by existing measures I mean traditional measures known to the ryots. Scientific measures are needed.

The few officers that we have are unable to cope with the work and then instances of pests, etc., do not come to their knowledge at all. When there is a pest, specimens have to be sent to distant places, and by the time remedies are suggested the mischief is done. The demonstrator-pundits might be instructed by Entomologists about the remedies of pests, etc., but when there is anything new, there is bound to be delay, but benefit would come in future.

(ii) Purity of seeds should be first ensured. If by internal measures are meant treatment of soil, then it is for experts to advise.

QUESTION 14.—IMPLEMENTS —(a) Heavy machinery fit for large holdings would not be usually suitable for the ordinary ryot. There would arise difficulties in finding capital, organising co-operation and mutual trust, without which heavy machinery could not be worked with advantage in small holdings.

Cheap and light agricultural machinery which could be worked by hand or bullocks could be introduced with advantage.

(b) By demonstration in their own lands or near their homes.

(c) Foreign manufacturers would not know exactly what implements would be suitable for agriculture here and for that mechanical engineers should, in consultation with agricultural officers, first find out what implements could be introduced with advantage. When they are found successful by demonstration sale depôts for such implements should be opened at accessible centres.

One thing suggested itself to me several years ago. The ryots usually have to dive during floods and cut jute stems one by one. Thus they become unfit for work in an hour. If an instrument could be made by which they could cut jute stems from boats, they can work for hours. I

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explained this to the Agricultural Department but they did not follow me and sent me a sample something like an axe. What I had suggested was something like a machine for lopping off branches of trees, inverted. I am still of opinion that this would be most useful.

QUESTION 15.—VETERINARY.—(a) Under this, I would mention that although elephants are plentiful here, almost nothing has been done for their treatment or how to utilise them fully. Evans's book is the only one which was compiled years ago and since then nothing appears to have been done and the treatment of these valuable and useful animals is still entirely in the hands of quacks.

I would amalgamate the Veterinary Department with the Medical.

(b) (i) There is one dispensary under the Local Board in the head-quarter station at Dhubri, but it has neither a hospital nor is it in any sense well-equipped.

I have already stated that I would place this department under the Medical and put Veterinary Surgeons in dispensaries in the mofussil. The present number is utterly inadequate.

(ii) No.

(iii) I would have the research institutions under the Government of India which should serve all the Provinces. The provincial officers could direct and inspect as the Civil Surgeons do in case of mofussil dispensaries.

(c) (i) This is not possible when the dispensaries are located very far off and one dispensary cannot certainly cope with the requirements of a district. Then there is prejudice against Veterinary Surgeons and very few people would come to them but prefer consulting quacks. This has to be overcome by showing that cattle could be successfully treated and the prejudice will slowly wear off as has been the case with the treatment of human beings.

(ii) I have no experience; but I think putting Veterinary Surgeons in mofussil dispensaries would be better. Travelling dispensaries would be necessary during epidemics. I would define jurisdiction of dispensaries.

The Veterinary Surgeons should work free during epidemics and for visits when taken for treatment they should have a fixed scale of fees but their visits should be compulsory.

(d) I would not have coercive measures at the present stage. The number is very insufficient now. There should be trained men for inoculation for coping with epidemics just as there are Vaccinators. Those willing in villages might be trained and paid like Vaccinators when their services are needed.

(f) Prejudice: no fee should be charged and when people see the efficacy of treatment, prejudice will die away.

(g) Yes; nothing has been done about elephants. I would have the research institutions centralised under the Government of India.

I have no knowledge of the Muktesar Institute.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) Investigation in these matters is necessary before one can say in which way livestock could be improved. It is however necessary that an attempt should be made to improve the local varieties by cross-breeding rather than that we should import wholesale, as the local varieties thrive better while imported varieties gradually deteriorate.

(ii) The dairying industry is still in its infancy and the methods most crude. Scientific methods are certainly necessary to improve the present state of things. It is notorious how the local milch cows give very little milk. There are large herds of buffaloes which give milk. Dairying could be introduced with great advantage with buffalo milk.

(iii) The care of cattle should be taught. At present very little is done for their feeding and no one wants to go to any expense for the draught cattle one has.

(b) (i) There are very few common pastures; there are some in *khas mahals* but they are not adequate.

(ii) Not in vogue here: the borders are too narrow here and neither fields nor pasture lands are enclosed.

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(iii) I do not think there is insufficient dry fodder: if, however, owners of cattle sell straw without storing enough for their own use, it is impossible to do anything.

(iv) In these parts there is not so much want in the dry season as during the flood months when all lands are submerged and nothing could be had. This happens during August, September and October. After the floods subside, cattle disease breaks out due to eating stale grass. What we want is the introduction of such fodder crops which could be stored for use in these months. We want expert advice about these and demonstration.

(v) This is for scientists to find out.

I think that each ryot should be taught to keep a plot of land for his own cattle and grow fodder crops there. It would be idle to ask land owners to keep free grazing grounds. If grazing grounds are reserved, ryots should pay a fee for each head of cattle.

(c) I have already mentioned that the fodder difficulty is most acute from August to October. Some difficulty is also felt in parts during March and April. In May, young shoots spring after showers which are fit for young growing cattle.

(d) We depend upon the Agricultural Department to find out which fodder crops could be grown in these parts and stored for the wet months. In the Punjab and the United Provinces this is done, but I do not know if those varieties could be stored in this damp climate.

(e) This depends on the type of men; there are many who take keen interest. The welfare of the tenantry would be the greatest inducement.

Landowners could keep grazing reserves, but the owners of cattle should pay a fee for grazing. Several attempts have been made in Gauripur estate and the difficulties encountered could be explained during oral evidence.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) From enquiries made here, I learn that an agriculturist would be occupied for more than nine months in the year, the time when they are free being different in cases of men cultivating different crops.

During the slack season he attends to the repairs of his house and other domestic duties.

(b) There are many subsidiary industries which the agriculturist might take up, such as weaving mats, bamboo and cane work, weaving, poultry, sericulture, lac, etc., and the local people do one or more of these desultorily. If Government give expert advice, advancing small capital where necessary, supply cocoons and lac-seeds and arrange for the sale of articles made, people would be encouraged to take up suitable home industries and stick to them when they find them lucrative.

(c) Want of expert advice and capital.

(d) I think the time is not ripe yet for the establishment of industries as are mentioned. The money available would be better spent if the people are first taught to improve their condition by scientific agricultural methods.

Some industries on co-operative principles, in whose profits the people might participate, might be first tried.

(e) The ryots are fully engaged in these parts and I do not think they will benefit by industries being established in rural areas. This might result in the next generation being diverted from agriculture.

(f) Yes, labour-saving simple apparatus which could be worked by hand would largely benefit the people. In order to ascertain the needs of the people and devise appliances, careful inquiry must be made by mechanical engineers in consultation with agricultural officers and the successful appliances should then be demonstrated to make them popular.

(g) The rural population in these parts have little leisure for employment.*

(h) Small village organisations should be started by Circle Officers (Government), the members of which should be educated in sanitation, etc., so that they might improve the health conditions of the rural areas.

* But see reply to Question 26104 on page 125.

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Trained midwives might teach the womenfolk the care of children, etc. Arrangement for recreation should also be made both for the men and women.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) *High wages:* The cultivators do not want imported labour. It is the farmers who do not work themselves who have to depend upon hired labour and it is becoming increasingly more difficult to procure labour except at wages which leave no margin of profit to the farmer. The farmer must take to more remunerative crops so that he can import labour on high wages.

(i) & (ii) Labourers might come temporarily but there is little chance of their settling down for good in these unhealthy places. In a few cases only such imported labourers have permanently settled (e.g., Santhals in Kachugaon and forest reserves).

(b) Because most farmers cannot pay attractive wages to imported labour in these parts.

The agriculturists do not require imported labour.

QUESTION 19.—FORESTS.—(a) Grazing facilities in forests are given only during floods. If by the use of the forest lands for agricultural purposes is meant the lands within forest areas fit for cultivation, then I would say that such lands are already under cultivation.

We would want expert advice and it is only because we entertain the idea that grazing would affect the growth and improvement of forests, that grazing is not formally permitted, although as a matter of fact, I should say, cattle do graze everywhere in forests.

(b) Quick growing permanent trees should be planted in places not occupied by cultivators for fuel purposes. There are other special annual plants used for fuel which could be grown on the borders of fields.

QUESTION 20.—MARKETING.—(a) Not at all—for want of roads and communication. I would mention Golakganj railway junction where a large area was set apart for the market in the hope that it was bound to expand due to its excellent and advantageous position. The railway authorities would not shift level crossings and the Local Board would not sanction roads leading to it. The result is that there has not been any appreciable improvement during a period of fifteen years. The merchants do not want to remain in this market as they do not get sufficient trade.

I do not know if the subject of uniform weights and measures would come under this head; but I would like to mention that there should be standardisation of weights without which the cultivators are imposed upon in several ways resulting in great loss.

(b) The existing system of marketing is not at all satisfactory. If the price of a certain article is high, the grower does not get much profit as it passes through many intermediaries.

I would take jute and describe the process up to a certain point. The grower usually has to entrust his jute to some one in the village who has a boat on commission sale. That man charges boat hire, takes a commission and sells the jute in a market to some petty merchant generally styled *faria*. This *faria* would sell the jute to purchasers of large firms; both of whom—I mean the *faria* and the purchaser—would make some profit. The jute will then be assorted, pressed and sold to a Calcutta firm and despatched by rail or steamer. I have no personal knowledge of what is then done. If the price of jute at Calcutta be Rs. 12 per maund, the grower would not get more than Rs. 5 or Rs. 6.

(d) A good deal might be done to benefit the cultivators by giving them expert advice based on statistics. It would not do to supply them with crop return, reports, etc., but they should be advised as to which crops are likely to be in demand next year, and which of them should be reduced based on the stocks. They might also be advised on the meteorological reports if any crop should be sown early or late.

I would illustrate this by the example of the price of jute this year which is almost half of last year's rates. The cultivators got very high prices last year and so extended the jute crop this year but the fall of prices has ruined many. The Government was in possession of statistics as regards the stocks and if the cultivators would have been warned, they would not have increased the cultivation of jute this year.

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There might be advisory boards consisting of officials and non-officials through whom these could be widely circulated.

QUESTION 22.—CO-OPERATION:—(a) (i) & (ii) I have indicated before that the success of the co-operative movement would depend upon the spread of education. There are serious difficulties to overcome in rural areas where the interests of the intelligent and well-to-do villagers are directly opposed to the spread of the co-operative movement. Those people lend money and food-grains, etc., at very large rates of interest. The principle of co-operation is however so very sound and this is so full of potentialities that this movement is bound to grow and do immense good to the people; but their progress would be slow in areas where the men are not educated.

I should prefer Government direction assisted by willing non-official workers.

(b) I think all the societies mentioned in (i) to (viii) would be possible and very useful excepting (v), which I think, would not be practicable under the present law.

The financing, however, should not be made dependent on contribution by the members and must be supplemented by Government loans where private capital is found to be shy.

I would lay much stress on sale societies so that the middlemen's profit might come to the growers themselves.

I think the Gauripur Co-operative Credit Society was the first of its kind in Assam but it had to be put to liquidation as the Registrar of Co-operative Societies would not allow us to work it in the way we considered in the best interests of its members. This was long ago, and, since then I am not in touch with the working of existing societies.

(ix) I shall think that want of recreation or amusements both amongst men and women of villages is taking away the enjoyment of health and life. Formerly the various religious ceremonies gave opportunities of meeting and served to enliven them. These are gradually dying out and nothing has replaced those institutions. Societies should now take the place of the old village committees and devise means for social amenities.

(c) I would not have recourse to coercive measures: besides, these measures will not be warranted by law.

QUESTION 23.—GENERAL EDUCATION.—(a) Please see my answer to Question 2 (xiii) (a).

(b) (i) Rural education should take the form of demonstration on village plots, technical and expert advice:

QUESTION 24.—ATTRACTING CAPITAL.—(a) To show them practically that such vocation would be paying.

(b) The tenants who have no abiding interest in the lands they have, cannot be expected to invest in improvements, the full benefits from which they cannot enjoy. The rights of tenants both under Government and zamindars are restricted but they could be depended upon for very sympathetic consideration as the prosperity of tenants ultimately benefits the landlords.

Want of capital is another factor.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) The prosperity of tenants would depend upon an increase of income and cultivating thrift. Another great evil is litigation which is mostly the work of village touts.

(b) Yes, such surveys would disclose the real state of existing things. They should be accurate and dependable and must be conducted by responsible and educated Government servants.

QUESTION 26.—STATISTICS.—(a) Statistics, as now made, are not accurate. They are based on reports of *chowkidars*. If they are made at all, an intelligent agency must be employed to collect them. I have already indicated above, how expert advice could be given to tenants based on statistics which might be of valuable service to them.

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Oral Evidence.

26061. *The Chairman:* Mr. Chakravarty, you are Dewan of Gauripur Raj?—Yes.

26062. You have provided us with an interesting note of your evidence; do you wish to make any statement at this stage?—No.

26063. On page 113 of your note on the question of research, you say you think that all research should be handed over to a central institution, for all-India?—Yes.

26064. Do you think a central institution would be capable of making due allowances for local conditions and carrying out the experiments to the point of adapting them to local needs?—I think it is quite possible if it is well equipped; it is better to have one well-equipped institution than ill-equipped institutions in different Provinces.

26065. You think it might be possible to reproduce the climatic and soil conditions of, let us say, Madras and the Punjab, in one and the same institution?—I think so to a certain extent. Of course, it is not altogether possible even in the present circumstances; if there is a research institution in Shillong, it does not work under the conditions that obtain in other parts of the Province; the conditions are quite different.

26066. Would you have any local institutions at all?—Well, that depends; I am not an expert so that I could not tell you much about it, but I think the result of experiments made in the central institution might be utilised by the local experts.

26067. Do you want some up-to-date laboratories for carrying on research work?—Yes, I should say so; but at the same time, I should like to have all research work under the Government of India; in one central research institution.

26068. In what you say about agricultural education are you thinking of educating boys for the Agricultural Service or the other branches of the public services, or are you thinking of educating boys to equip them as farmers?—I should start the agricultural education from the very beginning, from the primary stage; it should be adapted to the age of the boys, but I would not make any distinction between agriculturists and non-agriculturists in that respect.

26069. You think a certain proportion of those boys might go back to the farm?—Yes, I should specialise from about the Class VII of the high school; up to that I should make it a general subject in all ordinary education.

26070. Then you give us your views about the improvement of the economic position of the agriculturists in such countries as Japan. Do you know much about agriculture in Japan?—No, I have no personal experience; I merely know from what I have read.

26071. You say that the ryot in India is growing poorer and poorer?—Yes.

26072. What makes you think that?—From experience I see that they are growing poorer, because I should say the expenditure involved has increased, but there is no corresponding increase in their income.

26073. You think agriculture in India is declining?—In what way?

26074. In the economic way?—Economically, yes; because their requirements are much larger now and agriculture is not keeping pace with that.

26075. *Sir Henry Lawrence:* What do you say is larger?—Their requirements; I mean their expenditure is growing.

26076. *The Chairman:* Has that expenditure grown because of a rise in the cost of living or because of a higher standard of living?—Both.

26077. Under the heading of Agricultural Indebtedness you say, "The ryots have gradually lost the habit of work and now employ hired labour for operations they used to do themselves." Now what I want you to do, if you can, is to reconcile that fact, if it is a fact, with the statement that the ryot is growing poorer and poorer?—What we actually see is that they do employ coolies during the jute season for cutting the jute or for taking it to places where they will rot it; I have seen that from experience; from that I say that what they used to do before they do not do now.

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Of course, it depends upon the year; in a year when the price of jute is very high they can afford to do that; but in years when the price of jute is low, they would find the cost would be greater than the price they get.

26078. Do you think the productivity of the soil is getting less year by year; is that your view or not?—In some places it is, because I have often been told in some parts that the productivity is getting less and less.

26079. Of course we get used to hearing about the good old days in more directions than agriculture; do we not?—Yes.

26080. Have you got any facts to go upon in regard to this matter?—It is so, because formerly the area cultivated was very much less than it is now, and the manures they had, cowdung and other things, were quite sufficient. Nowadays they sow on the same soil every year, whereas formerly, after taking one crop, they would probably leave the land fallow for two or three years; they cannot afford to do that now. That is perhaps the reason why they do not get as large a yield as they used to get.

26081. If you burn down virgin jungle and take a couple of years' crops off the land, you enjoy a degree of fertility which you cannot in reason expect the land to maintain unmanured?—No, we cannot; but what the cultivators say is that from the same plot of land they do not get the quantity of rice that they used to get.

26082. Because they do not put enough manure in; is that the point?—Yes.

26083. I see that you are prepared to go so far as to put the Agricultural Department under the Education Department?—Yes.

26084. Do you think that agriculture is of such dominating importance in the Province that the whole educational system should be subordinate to agricultural considerations?—Yes, I think if that were the policy of the Government of India from 1857, there would not have been the disinclination on the part of educated men to take to agriculture as a profession.

26085. In answer to Question 3, you cite an incident where the Agricultural Department provided you with what you believe to be bad seed. I raised the point with the Director of Agriculture when he was in the witness chair, and his view was that the seed was provided too late and that it was planted too late. He was quite prepared, I understand, on behalf of the department, to take a share of the blame for the lateness. Do you think that is a reasonable explanation of the failure?—In that case, they should have advised us not to use that seed.

26086. That ought to have been done; and there perhaps they failed?—A certain crop was damaged by floods, and we wanted only that sort of paddy which would be suitable for late sowing.

26087. On page 116 on the question of finance, you say, "the most influential and moneyed people in a village—on whom depend the success of these institutions—are generally antagonistic." Is it because they are moneylenders?—Yes, they are moneylenders and they also lend paddy.

26088. They do not like the co-operative societies lending at lower rates of interest?—They do not like it at all.

26089. As regards implements, you give an instance where you made a specific request to the department for an instrument devised to cut jute below water?—Yes.

26090. I just wanted to get from you some indication of what scope there would be for an instrument of that nature. How much of the jute is cut in flood time?—Almost all.

26091. It almost always involves diving down?—Sometimes they have to dive; sometimes they have to go as deep as their waist. Almost half the area in the Gauipur Raj is under water about that time.

26091-a. Do you think there will be a market for it?—I think it would be very much utilised if it were found successful.

26091-b. Why do you not invent one yourself?—I am not a mechanical engineer, I can only suggest.

26092. Then you are inclined to amalgamate the Veterinary Services and the Indian Medical Service; is that so?—Yes.

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26093. Are you anxious to be dosed by a Veterinary Service man, or do you want an Indian Medical Service man to doctor your cow?—Not that; I wanted both departments to be under one Director.

26094. You would not merge them into one?—No. I have suggested that the Veterinary Assistants should be placed in the same place as the Sub-Assistant Surgeons in the villages so that they will be more accessible; that was my idea.

26095. Have you any idea of how many domesticated elephants there are in the Province?—No; I could not say. I can speak about Goalpara alone. In Gauripur the Raja keeps about 25.

26096. Have the numbers decreased?—Yes, certainly. During the last three years we lost about six.

26097. After all everything must die, including elephants?—But some of them died very young.

26098. Do you think that the scope for their utility is narrow and diminishing?—I think so, because none of the zamindars use them for bringing timber; they use them only for *shikar*.

26099. Is that because motors have come in?—I do not think so. Elephants are put to a different use. We have to depend upon elephants in the countryside because there are very few roads there by which we can take motors.

26100. How do you account for the decline in the extent to which elephants are used?—They have not declined in use, but what ought to be done in a Province like Assam has not been done. There are many elephants, but nothing has been done about their treatment. I think they might be more widely used than at present.

26101. Dr. Hyder: Do you not think the zamindars keep elephants for pomp and show?—Very little for that. It is for *shikar* that elephants are used. They do not like to put their *shikari* elephants to any other use. For inspection work in the country it is the only sort of conveyance.

26102. The Chairman: On page 120 you say that, during the slack seasons, the cultivator attends to the repairs of his house and other domestic duties. Is that so?—After I answered the Questionnaire, I collected some of the cultivators and questioned them; they would not say that they were free, but from enquiries I found out that there are two or three months during which there is no work.

26103. What do you mean by domestic duties?—They repair their houses, and perhaps put up new fences. I do not think they are fully occupied during that time.

26104. On page 120 in answer to Question 17 (g) you say, "The rural population in these parts have little leisure for employment." Do you wish to correct that?—Yes, I want to correct it. It was after this note was sent that I collected some tenants and made enquiries.

26105. Is all the transport in the district with which you are familiar done by wheeled carts?—Yes, by carts. Small loads are borne by the men themselves.

26106. Would you turn to page 122? You say there that the decline in religious ceremonies accounts to some extent for the lack of attraction in village life. Would you say that religion as a whole is declining in the districts?—I should think so.

26107. You do not think it has the same influence as it had when you first came to know the countryside?—I do not think so.

26108. Sir Thomas Middleton: I see that you are an educational reformer. You would put the Agricultural Department under the Educational Department. As I read your précis, I supposed that you would have argued the other way and that you would put the Educational Department under the Agricultural Department?—It means the same. I want both under one head. There will be a Civilian Officer at the head of the two departments and there will be agricultural and educational experts under him.

26109. But you regard agriculture as so important that it should condition the whole educational service of the country?—Yes. Of course where specialists are necessary specialised education may be provided.

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26110. You would begin to teach all the boys from the time they are in the middle vernacular or English school?—Even from the primary classes.

26111. You would begin to teach them in the primary classes?—Yes, that is my idea.

26112. At what age?—Of course it will not be from the lowest classes, but from the time they have learned to read I think, agriculture should form part of the curriculum.

26113. From what class would they be able to read intelligently?—From the fourth class of the primary schools, that is the top class.

26114. Then they will be able to read?—Yes; just when they are taught something of, say, history or geography, they should also study agriculture.

26115. That means, in practice, you would begin about the time they reach the middle school, that is, the fifth standard?—I would start even earlier, from the top class of the primary school.

26116. I do not know how you grade your classes. How many classes are there in the primary schools?—Four.

26117. The fifth and sixth classes, where are they?—They generally go to middle English schools after the primary school. There are also some middle vernacular schools, but I think they have fallen into disuse. They go to the middle English schools after completing their course in the primary schools.

26118. Your idea is that from about the fourth standard they should be studying agriculture?—Yes.

26119. You point out, quite rightly, that if that is to be done the teachers must be properly trained?—Yes.

26120. Do you think it would be possible to train a sufficient number of teachers for all your schools?—For the primary schools it would be quite possible, because the teachers are trained in training schools and they can be taught sufficient agriculture there to meet the requirements of teaching agriculture in the lower classes. I have suggested that the duties of the agricultural demonstrator and the teacher may be combined in one man.

26121. That course has been followed in certain countries, but I understand the difficulty is that the teacher who is usually employed in the Indian primary schools has no interest in agriculture?—If he comes from the agricultural classes he will be interested, and besides, these teachers will not have a high standard of education.

26122. I have heard that when a man from the agricultural classes becomes a teacher, he wants to escape from agriculture?—That is why I say that education in agriculture should start from the beginning of the school course. The agricultural classes say that they do not want to put their sons into the schools because in that case they would not be agriculturists any longer.

26123. I think you are the only witness who has mentioned elephants. What is the value of a good elephant?—Rs. 4,000 to Rs. 5,000.

26124. What does it cost to keep?—About Rs. 120 a month.

26125. *Dr. Hyder*: What is the value of a dead elephant?—The tusk is the only thing that has a value.

26126. *Sir Thomas Middleton*: The cost of keeping it is very considerable?—Yes, it is.

26127. Is it your opinion that a great deal of the money that is spent on that might be better spent on the improvement of other kinds of stock, or would you like to improve the elephant?—Some elephants are necessary, especially in Assam, for ordinary inspection duties because that is the only conveyance you can have. Then, it depends on the rich people whether they would like to have elephants for ceremonial purposes as well as for *shikar*; if a man is keen on *shikar*, he cannot do without elephants. They cannot be had for hire.

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26128. *Dr. Hyder*: Is there any trade in elephants from Assam?—There is a trade in elephants in this way that when the elephants are caught in Government forests, traders from all parts of India come and buy them. They make a profit on this.

26129. You speak of the death of a number of coconut trees; is that due to wasteful tapping?—Not at all; there was a blight, what they call rhinoceros beetle or something like that; it burrowed inside the tree and the top died away gradually. In this way, I think we have lost three-fourths of what we had.

26130. Did you report this matter to the Agricultural Department?—Yes.

26131. They could not do anything?—I do not know if they did anything.

26132. Even those trees which you kept for food purpose, died?—In these parts, the coconut tree is not used for any other purpose; we do not tap it at all; it is the palm tree that is tapped, not the coconut tree.

26133. With regard to the use of bones, is there any particular caste of people which collects the bones?—I think some Mahomedan contractors collect the bones and sell them to the companies.

26134. You think these bones would be useful if they were crushed by the cultivators?—I think if they are allowed to remain as they are it will take a long time for them to be turned into manure.

26135. And if they are crushed?—I think they will be of some use.

26136. They would be used; there would not be any prejudice?—No; not for using these as manure; but the Hindus would not crush them. Some people do not like that the bones should be taken away; they like that they should remain where they are, but what I suggest is that in that case it will take a very long time for them to be turned into manure.

26137. Would you like to have a crushing plant in your Raj?—What I suggest is that if there could be a simple way of doing it, that would be beneficial, but if you have a crushing plant you will have to have it near the railway, you will have to carry the bones there, convert them into bone dust and bring it back, which would be rather difficult; the question is whether anybody will take so much trouble for the purpose.

26138. Talking of village life, have you got any village games, dances and things of that kind?—There are not many games; of course, wherever there is a school they have games like football.

26139. I was referring to the native games; are there any of them?—Boat-racing is one.

26140. In Goalpara, do the people take any interest in boat-racing?—They do take a little interest in boat-racing, but I do not know of any other local games or amusements which are largely practised.

26141. You are aware that in other parts of India the people are organising Indian games?—I have no experience of them.

26142. *Mr. Hazlett*: As regards the present educational system, I understand your chief objection to it is that the ordinary village boy who goes to a primary school gets a dislike for all kinds of manual labour; that is one of the effects, and hence you suggest that the Education Department should be abolished and made into an Agricultural Department?—No, I did not say that; I want to amalgamate both the departments.

26143. I gather from your evidence that the effect of our present primary system of education is to create in the village boy a dislike of manual labour of all kinds?—Yes.

26144. He does not want to take to agriculture when he leaves school?—That is so. But what I say is that, if he is properly trained from the very beginning, that prejudice will die away.

26145. That is the reason why you want the school converted, in the ordinary sense of the word, into a more or less agricultural school?—What I want is that just as history or geography is a subject for study, so also one of the subjects, from the primary schools up to a certain point, should be agriculture combined with demonstration.

26146. Can you tell us from what class of people the ordinary village schoolmaster comes; is he a man of the *bhadralog* class?—There are very few from the *bhadralog* class in primary schools.

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26147. He comes from one of the peasant classes?—Yes; the pay that they get does not attract men of the *bhadralog* class; it is almost always the villager.

26148. Is he a man of the Kayastha class?—Not necessarily; he may be a Mahommedan, he may be a Kayastha; they come from all classes.

26149. What I want to get at is whether he is a man who scorns manual labour of all kinds?—No.

26150. He will go out to the fields and work there?—From what I have seen there are several village schoolmasters who are farmers.

26151. Why do the boys attending these schools get the idea that manual labour is a bad thing?—They come into contact with the *bhadralog*. There is a sharp distinction between *bhadralog* and *chashas*; a *chasha* in other places means a farmer; in this country it means something much worse than a farmer; *chasha* means a man without polished manners, and with little education.

26152. *Dr. Hyder*: Have you got many of the *bhadralog* residing in your villages?—There are some.

26153. *Mr. Hazlett*: What I want to know is why the present system of education gives this idea to the boys that manual labour is a thing to be despised and scorned as one of the lowest ways of earning one's livelihood; it is not the usual thing in other countries?—Because the *bhadralog* have not taken to agriculture.

26154. They look down upon and despise agriculture, and the ordinary schoolmaster more or less unconsciously implants that idea in the minds of his pupils?—I do not think so; my experience is that many of the teachers of the lower primary schools come from the agricultural classes.

26155. And still the evil goes on; the ordinary village boy who can read and write does not want to take to agriculture; why is that?—There is some reason in that; they do not know that agriculture pays and that it is possible for a gentleman to be a farmer and earn a decent livelihood from farming; that is what I mean.

26156. As regards the poverty of the ryots, you say in your evidence that you find the Mymensingh Mahommedans who come into your zamindari are much better cultivators and become wealthier than the ordinary Assamese ryots. Is it because they work harder, grow more crops and are more industrious?—They are more industrious, and they know more about agriculture.

26157. Do you find they work the whole day, start work in the morning and go on till evening?—I could not say the exact number of hours they work in the day, but generally speaking, I should say they are much more intelligent farmers and agriculturists, and they are more hard working.

26158. The ordinary Assamese cultivator does not care to work in the afternoons; he likes to go out in the fields in the morning, work there for four or five hours, and return home in the afternoon?—In Goalpara district, there are no people who take opium; opium taking is connected with the laxity of Assamese cultivation.

26159. I am thinking more or less of the Upper Assam Valley districts; you do not find them in Goalpara. In the Upper Assam districts, the cultivator is so lazy that he will not work more than four hours a day; with that he thinks he has done a full day's work?—I may cite one specific example. In an area very near Dhubri there was fallow land some years ago which the local people would not take; a man from Mymensingh side came there, took that land, and in the first year he got about Rs. 600 worth of jute, in fact more than what he paid to the zamindar; that was during the floods; I found that the local people could not cut one stem of jute on the plots adjoining that area, but this man dived and cut every stem of jute, and got Rs. 600 worth of material.

That is an example of energy and what it can do.

26160. About elephants, is it not a fact that elephants are used in the timber trade to drag timber?—I have no experience of that personally.

26161. In most of the Upper Assam Valley districts elephants drag the timber during the cold weather, and are used for *shikar* during April and May?—We have started the experiment now, in Gauripur Estate.

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26162. You mentioned Rs. 5,000 as the price of an elephant; that is the price of a good elephant?—Yes, not when they are caught.

26163. A *shikari* elephant costs about Rs. 5,000?—A good *howdah* elephant would cost much more than that. What I say is that a normal, full-grown, good elephant will cost about that amount. When they are purchased I think the cost will be Rs. 2,000 to Rs. 2,500 but many of them die, and it is risky to buy elephants like that; you will have to wait for four or five years before you make use of them.

26164. *Prof. Gangulce*: At the beginning of this century, one of the Assam Commissioners expressed his hope in regard to agriculture in this way; he had little hope that improvement will be effected in these matters till reformers arise among the landowners themselves. Do you agree with that view?—Do you mean to say that unless the zamindars are the actual agents who can improve agriculture, there will not be any agricultural improvement?

26165. Till reformers arise among the landowners themselves?—I do not think so.

Note by the witness:—The co-operation of zamindars would be certainly a great help to the cultivators, but there is this consideration that the zamindars have now very little influence over their tenantry and the latter think that as long as they pay rent, there is no more obligation in their part and they are being taught to look with suspicion on all measures attempted to be introduced by zamindars.

26166. You do not agree with that?—No.

26167. Are you aware of the agricultural development of other countries?—No, I have no personal experience of that.

26168. Of England, for instance?—No.

26169. The Gauripur Raja is one of the prominent landowners of this Province; what is the area of the estate?—600 square miles.

26170. You have a demonstration farm?—Only one farm.

26171. Where is it situated?—About three miles from Gauripur.

26172. It is managed by the estate?—Yes, it is managed by the estate. Originally I should say it was not anything like an experimental or demonstration farm; it was a farm originally for producing certain varieties of rice and other things for the consumption of the Raj family; gradually it has developed into some sort of an experimental farm in the sense that we have lent a certain area to the Agricultural Department, who try jute, sugarcane and paddy on it.

26173. Do you contribute to the expenditure of the farm?—The whole expenditure is borne by the estate.

26174. You have an agricultural officer in charge of the farm?—No; the few *bighas* that are with Government are under the inspection of the Agricultural Department.

26175. Since when has the demonstration farm been going on?—For six years.

26176. You have no agricultural officer appointed by the estate?—No.

26177. You depend for your demonstration and experimental work on the Department of Agriculture?—Yes.

26178. *Sir Henry Lawrence*: How much do you spend on it?—About Rs. 3,000 or Rs. 4,000.

26179. *Prof. Gangulce*: What is the area of the farm?—About 150 acres.

26180. Does any demonstration work go on there?—Demonstration goes on only in the area which has been lent to Government.

26181. Your tenants come and attend such demonstrations?—The Agricultural Department often invite other people to see a successful crop.

26182. Is any demonstration held on your farm?—That sort of demonstration is not held on my farm.

26183. So, it cannot be called a demonstration farm?—No.

26184. Do you tour about a great deal in your estate?—Yes.

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26185. Can you tell the Commission whether you have introduced any change in the method of cultivation, as, for instance, the use of manure and things of that kind?—They are very slow to take to improvements.

26186. How long have you been the Dewan of this estate?—I have been there for about 24 years.

26187. And you have not seen any decided change in this period?—If you show them by demonstration that by using a particular manure the yield will be larger, they will take to it. I know from personal experience that they have taken to certain varieties of paddy which have been found very successful in that farm, and also to a certain variety of jute.

26188. Your tenants are interested in improved varieties of jute and improved varieties of rice?—Yes.

26189. Have you any seed stores?—No.

26190. You do not assist your tenants to get better varieties of seeds?—Whenever we do it, we do it through the Agricultural Department. After the floods we have tried certain varieties from the Sylhet district, but I cannot say that we have done it systematically.

26191. In this note that you have given us you evince a good deal of interest in cattle improvement. Have you any cattle farm?—No.

26192. Gauripur Raj has no special breed?—No.

26193. From where do you get your milk-supply?—We buy some cows; that is all.

26194. You have no dairy of your own?—No.

26195. Have you any co-operative society?—I think we had the first co-operative society in the Province started in the Gauripur Raj in 1904. I think it was in 1916 that the last society went into liquidation; there was a difference of opinion amongst us and later on all the societies which were started were run by the Government Co-operative Credit Societies Department. The estate had nothing to do with them.

26196. Do your tenants borrow money from you?—We have not got any agency for giving money. It is only for very special reasons that they borrow money. When there is a hardship caused by floods or some such things we do lend out money.

26197. What are the chief crops grown by your tenants?—Paddy, mustard seeds and jute are the principal crops.

26198. Do you assist your ryots in marketing jute?—We have not done so, but we had a discussion with the Deputy Director of Agriculture on the question of starting a co-operative credit society for marketing jute.

26199. Do you supply them with any information with regard to the market in Calcutta?—We do not, but I have suggested that something ought to be done for them.

26200. You refer to your educational system in this note. I do not propose to go into details, but what I want to ask you is whether you have a number of primary schools maintained by your estate?—All the primary schools are maintained by Local Boards. Formerly we used to contribute towards the upkeep of these primary educational institutions, but it has now been discontinued not because we did not want to give the money but because the Local Boards wanted to take up the full cost of the education in the primary schools.

26201. The Raja takes a good deal of interest in Local Boards. Is he a member of the Local Board?—Now the system is elective but there are always some members from the Gauripur estate who are not officials.

26202. Have you suggested some sort of agricultural education in your schools?—No.

26203. What were the chief causes of failure of crops during these last 24 years that you have been the Dewan of the estate?—I should say that flood is the most important cause.

26204. In reply to Question 25, you suggest that surveys ought to be made in order to find out the real state of affairs. Have you instituted any inquiry into the economic conditions of your own tenants?—No, we have not.

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26205. *Mr. Calvert*: You say that you think an attempt should be made to reduce the rate of interest by legislation?—Yes.

26206. What is it that you are thinking of?—Something like the Usurious Loans Act.

26207. You have got that Act in force in your Province, have you not?—The Act is in force but seldom resorted to.

26208. Germany has now made usury a criminal offence punishable with six months' imprisonment; would you go as far as that?—I would not go so far as that.

26209. *Mr. Kamat*: You suggest that the Veterinary Department should be amalgamated with the Medical Department?—Yes.

26210. Is that in the interests of economy?—To a certain extent, yes.

26211. How much economy would you effect if the amalgamation were done?—I am not competent to say because I have not studied the budget. I do not know much about the details of the working of the departments.

26212. From the public point of view it would be convenient to have a veterinary dispensary wherever the ordinary dispensary is located?—Yes.

26213. There would not be any loss of efficiency in the Veterinary Department by its transfer to the Medical Department?—My idea is that there should be experts under the Director, who might be a civilian. But, if you want to amalgamate these two dispensaries, there must be veterinary experts under the Medical Department.

26214. *Rai Bahadur R. M. Das*: Does the Gauripur Raj spend money over the improvement of the health and sanitation of its tenants?—We help them in this way that we subscribe to the Local Boards for dispensaries.

26215. How many dispensaries have you got?—In the whole of the Gauripur Raj, besides the dispensaries at the headquarters of the district there are four dispensaries.

26216. And you contribute towards all these?—Yes; the Gauripur dispensary is fully maintained by the estate; and there are other dispensaries towards which we also contribute something.

26217. Do you do anything in the way of imparting primary education to your tenants?—That is absolutely in the hands of the Local Boards.

26218. Your estate does not spend anything on it?—We do subscribe something for the middle English school. There are four middle schools in the Gauripur estate.

26219. You say that floods damage the crops of your tenants. Did your estate think it necessary to start any embankment work for the protection of crops?—Embankment will not do much good because it will have to be extended to other zamindaris; so if I were to do a bit, that would not help the ryots in any way.

(The witness withdrew.)

The Commission then adjourned till 11-45 a.m. on Wednesday, the 15th December, 1926.

Mr. Dijesh Chandra Chakravarty]

Wednesday, December 15th, 1926.
SHILLONG.

P R E S E N T :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.O.S. Sir THOMAS MIDDLETON, K.B.E., C.B. Sir JAMES MACKENNA, Kt., C.I.E., I.O.S.	Mr. H. CALVERT, C.I.E., I.O.S. Professor N. GANGULEE. Dr. L. K. HYDER.
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Mr. J. HEZLETT, I.O.S. Rai Bahadur RAMANI MOHAN DAS. Mr. J. A. MADAN, I.O.S. Mr. F. W. H. SMITH.	} (<i>Co-opted Members</i>). } (<i>Joint Secretaries</i>).
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**Mr. W. HARRIS, M.R.C.V.S., I.V.S., Superintendent,
 Civil Veterinary Department, Assam.**

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (ii) Each Province should have its own properly equipped research laboratory in charge of an officer trained in this work. Further knowledge is still required on many diseases, such as, surra in cattle and buffaloes, foot and mouth disease, anti-rabic vaccination in animals, bovine infectious lymphangitis, nasal granuloma, etc.

QUESTION 15.—VETERINARY.—(a) The Civil Veterinary Department, Assam, is not under the control of the Director of Agriculture.

(b) (i) Local Boards control the veterinary dispensaries. The buildings are provided by the Local Boards who pay two-thirds of the Assistants' salary. Government pays one-third, supplies the instruments and contributes Rs. 50 towards the cost of medicines. The Assistant's tour programmes are checked by the Local Board who pays his travelling allowance. In certain cases, Government subscribes to the cost of a second Assistant in addition to the above. The work of the Assistant is checked by Inspectors. Returns of the Veterinary Assistant's work are sent by him to the Superintendent, Civil Veterinary Department. Assistants are transferred by the department but the Boards are previously consulted and their wishes considered. This system seems to work satisfactorily.

(ii) The demand for veterinary aid has increased and the present staff is unable to cope with the demand when contagious diseases are present. The number of Assistants has not been increased as the Local Boards are unable to provide funds.

(iii) The provincial authorities entirely control the Reserve Veterinary Assistants and the Inspectors.

(c) (i) These ryots and cattle-owners in the vicinity of a dispensary make full use of the dispensaries. Only a small proportion of ryots is so placed. Dispensaries would have to be multiplied.

(ii) Veterinary Assistants tour with a small stock of drugs. The object being to let the ryots know of the department, to give him advice and treat sick animals. Under normal conditions the Assistant is on tour from ten to fifteen days in each month.

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(d) The obstacles are many; such as: no notification or receipt of information too late; objection to segregation; no proper disposal of carcasses; objection to inoculation; free movement of sick and incontact animals.

Legislation would be of little use without the necessary staff to carry it out. The ryot would actively resent any interference. Legislation carried out by half measures would be of no advantage. So, under the present circumstances, it cannot be recommended. By teaching and by bitter experience the ryot may gradually come to appreciate the advantages of these essential points. Segregation, disposal of carcasses, etc., entail extra labour and are not popular. Contagious diseases are often deliberately spread by *Chamars*.

(e) There has been little or no difficulty in securing sufficient serum.

(f) The obstacles against preventive inoculation are religious objections and apathy of the cattle-owners. No fee is charged for serum inoculation.

(g) I consider that further facilities for research in animal diseases are most desirable and important, first by an extension of the Muktesar Institute, and second by setting up provincial veterinary research institutions.

(h) I would suggest that special investigations should be conducted by officers of the Muktesar Institute, but as it is necessary to study diseases under varying local conditions provincial officers would have to do this.

(i) I recommend the appointment of a Superior Veterinary Officer with the Government of India. He would act as adviser to the Government. This seems to be done at the present time by the Director of the Muktesar Institute and thus his legitimate work of research and control of a large institute is interfered with. Research work would be synchronised and overlapping prevented. Educational work requires speeding up and making more uniform. His advice would be sought on professional questions that may arise from time to time.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) Improvement in the breed of the local cattle and an increase in the yield of milk are much to be desired; until the cattle-owner shows a genuine desire for improvement on these points no real advance can be made.

(b) The grazing grounds for village cattle are usually overstocked. The herd contains a large number of useless animals rendered so by age and disease. Much of the disease is parasitic and the grazing ground becomes badly infected. The owner is unwilling to get rid of these useless animals.

It is a common custom to cut off the ears of rice and leave the straw standing for the cattle to graze on. Straw may sustain life but it is not a diet for the production of energy or milk. Straw with a little grass and weeds is the only food that many village cattle get.

There seems to be a deficiency in mineral constituents in the fodder as shown by the small bones and joints of cattle and horses bred in the plains.

Generally speaking, there is a fodder shortage during the last half of the cold weather, during the hot weather and again in the middle of the rains when the grazing grounds are flooded.

With the exception of growing green fodder crops, conserving the straw and feeding on grain, no further suggestions can be made.

Oral Evidence.

20220. The Chairman: Mr. Harris, you are Superintendent, Civil Veterinary Department, in the Province of Assam?—Yes.

20221. You have given the Commission a note of the evidence which you wish to tender. Do you desire to make any observations at this stage other than those covered by the note?—I have nothing further to say.

20222. What staff, if any, have you under your own control at headquarters?—At the present time I have nine Reserve Veterinary Assistants, one Staff Assistant in Gauhati; three Inspectors, one in Gauhati,

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one in Dibrugarh and one in Sikkim, and also one other Staff Assistant in Sikkim.

26223. Where are most of these officers trained?—All in the Bengal Veterinary College.

26224. You have, of course, no training facilities in this Province?—No, not at all.

26225. Is that staff reasonably adequate?—We find it very inadequate. We had a very heavy outbreak of rinderpest in the last two years and we found it very difficult to cope with the work; with double the staff we can get on with the work.

26226. Is there difficulty in financing in this Province a sufficiently large staff to deal with these epidemics when they arise?—Yes; that is the difficulty. We want a large staff. If a large number of cattle are affected at one time, it is very difficult to manage and we have no facilities for stopping the movement of cattle or anything of the sort, although the disease is spreading rapidly.

26227. Do you suggest that there ought to be powers enabling you to stop the movement of cattle?—I have made mention of it in my note and I say it will be no use giving us powers without the necessary instrument to carry them out.

26228. Efficiently to administer rules of this sort in a country of this nature would require a very large veterinary police force?—Yes and a tremendous amount of opposition would be met with.

26229. So that, broadly speaking, it is your view that the time has not yet come for legislation directed towards that end?—That is my view at present.

26230. On page 132 of your note, you give a list of the diseases which in your view need further attention. We have had a certain amount of evidence tending to show that the elephant which is an important animal in certain districts in the Province is not receiving the attention which it deserves; do you agree with that?—As regards the general treatment, yes. It requires more study; persons in charge of elephants know very little about them. I have made a point of studying elephant troubles and diseases and more care has got to be taken of elephants by officers under whose charge they are. The elephant is entirely under the control of the mahout who is rather an ignorant person; but if the mahout disagrees with anybody, there is no other man to take his place and it is very difficult to control the mahouts.

26231. I suppose there is a parasitology of wide range which is specific to the elephant?—Yes; we have a lot of parasites specific to the elephant. There is one fasciola in the elephant which is different from the cattle one.

26232. Would you be prepared to add the diseases of elephants to this list of subjects which require attention?—Yes.

26233. On the same page of your note you say, "Local Boards control the veterinary dispensaries." I gather from your note that on the whole you are satisfied with the manner in which the Local Boards are carrying out their responsibilities in this direction?—Yes; I am satisfied generally; but I am dissatisfied because the Local Boards do not employ more Assistants. They employ one and sometimes two Assistants; but these are very insufficient for the area controlled by the Local Boards.

26234. These are the Assistants who are trained in Bengal?—Yes.

26235. Are they mostly men who have gone from the Province to be trained in Bengal and go back to the Province?—Yes; all belong to our Province with one or two exceptions.

26236. Do you find constant inspection of the Assistants' work necessary to keep them up to the mark?—It is necessary indeed.

26237. Have you had many complaints of bribery and like charges against the Assistants?—We have very few cases like that. We are always watching and inspecting their work.

26238. In connection with inoculation, I see on page 133 of your note you say that you meet with a certain amount of obstruction on religious grounds?—Yes.

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20239. Is that common in the Province?—It is comparatively common, yes.

20240. Amongst what people?—Amongst the Hindus.

20241. You do not think that it is put forward as an excuse by a man who does not want to lose two or three working days?—No; I do not think so because the serum inoculation will not make him lose any working days.

20242. It is the single or serum-alone method and not the simultaneous method?—No; we cannot carry out the simultaneous method in this Province, there will be great objection to that method.

20243. Have you had many casualties?—We had no casualties from simultaneous inoculation at the Government farm; but we had one or two afterwards from piroplasmiasis.

20244. Are you satisfied on the whole with the service rendered by the Muktesar Institute?—Yes; I am quite satisfied on the whole.

20245. Do you wish to put before the Commission any views about the position of the veterinary head of the Muktesar Institute? Have you any scheme in your mind for the creation of a post of Veterinary Adviser to the Government of India?—Yes; I think there should be a Veterinary Adviser to the Government of India and the Director of the Muktesar Institute should be free to run the Institute and carry out the research work.

20246. You mean you do not think that one and the same person could fill the dual roll of Veterinary Adviser to the Government of India and effective head of the research work at Muktesar? Is that your view?—Yes; that is my view. When research work is going on, it is very difficult if it is often interrupted. Experiments and things like that often go wrong if they are interrupted.

20247. Have you in the course of your experience in the Province studied the indigenous method of veterinary medicine at all?—Yes, a little bit of it; we tried a little of it but not very much.

20248. Have you come across anything valuable in that system?—Nothing valuable at all. We are trying indigenous medicines but drugs such as astringents, etc., prepared by our methods are equally good or probably more effective. I cannot see anything valuable at all in them.

20249. Have you got a pathological laboratory?—Yes; I have a little laboratory for diagnostic work.

20250. Do you use any other laboratories in other Provinces for that purpose or do you send the material to Muktesar?—I send material from suspected rabid cases up to Shillong; I do not deal with them in Gauhati; I send them up here for diagnosis.

20251. There is a considerable horse population in the Province, is there not?—Yes; they are both imported and bred in the Province, hill ponies.

20252. Can they be bred satisfactorily in the Province?—No, they cannot be bred for our work because they are very weedy.

20253. Is that due to the lime deficiency?—Yes, partly; a great part of it is due to lime deficiency, and a great deal is due, of course, to haphazard breeding, having no idea of the simple methods of breeding and selection.

20254. Is the smallness of the size of the horse a matter of choice or of necessity?—It is simply a matter of necessity; with their methods they cannot breed hotter animals. They would rather have them stronger but they cannot breed them stronger. They used to have a very fine type of horse in Manipur, the Manipur ponies. Some time ago I was talking to the Raja about improving the breed, but he said the *gurus*, who are Hindu priests I think, would not allow him to breed from stallions over three years old. That is of course a great mistake as they are not then sufficiently mature. He was not using mature ponies to breed from. That is one of the reasons why the Manipur ponies have degenerated.

20255. It seems rather a serious invasion of the secular field; is that some religious sentiment?—Religious sentiment, yes.

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26256. Have Government ever provided premium stallions in the Province?—No, we do not do that.

26257. Do you think the number of horses and their value to the cultivator are sufficiently important to justify a policy of that sort?—No, not at all. All work is done by bullocks here; there is very little done by ponies.

26258. Do you know the horse population of the Province?—Not off-hand; I cannot remember what it is; it is not very great.

26259. We have heard from other witnesses something about the cattle problems in the Province; I do not know whether there is any special branch of that subject in which you are particularly interested; we should like to hear your views if you care to put them before us?—I have made some remarks on page 133 of my note. I find it is a very difficult problem to tackle, for various reasons; one of the chief reasons is the fodder shortage; there is also the lack of milk for young animals, and the lack of knowledge of any principles of breeding. Another point, and a very difficult one, is that we cannot get rid of the inefficient animals; the old and diseased animals are allowed to linger on, increasing the number of cattle. If they could be removed in some way, it would be a great benefit, but we cannot do that.

26260. Is it your view that a substantial improvement in the condition and working value of the cattle might be achieved by improved nourishment without any alteration in the breed?—Yes, undoubtedly; the present breed could be improved considerably by improved nourishment and selection.

26261. But the rural population has no conception of breeding policy at all?—Absolutely none at all, and they will not help in any way. For instance, we had two very good bulls in a place called Silchar; I might point out our difficulties there. The people would not bring their cows for service. We itinerated the bulls; I kept a record of all the work that was being done and we examined the calves afterwards. The calves were a great improvement, but they started degenerating soon afterwards because they got insufficient milk. We tried to point out to the people that they must give them more milk, but it was not done; the calves were starved and so the whole experiment was an absolute failure; the ryot would not take the trouble.

26262. There seems to be no appreciation whatever of the fact that if you want a healthy calf you must have a well-fed mother?—Absolutely none at all.

26263. Apparently the calves are invariably half-starved?—Yes, invariably. One can see calves being sent out to the pastures, the paddy fields, with their mothers; a straw basket is tied round the mouth of the calf by a piece of string round its ears, to prevent the calf suckling; it cannot eat either, so that it is starved all day.

26264. That is to conserve the milk for domestic purposes, is it?—Yes.

26265. Have you studied the possibility of developing the sheep-grazing industry?—We tried sheep up here in Shillong some time ago. The remark was made that those low hills down the road looked good sheep-grazing grounds. It was an absolute failure for two reasons: the conditions were too wet here and there was no grass. On these green slopes on the hill sides there is no bottom grass; it is all jungle grass, very sparse, and the sheep practically starved on it. We once sent the cattle down from the Upper farm to try and graze them, but they starved.

26266. It might be possible to induce fodder grasses to grow, but that would not deal with the problem of the monsoon?—No.

26267. Is it so severe here that sheep cannot stand it?—Yes, they cannot stand it.

26268. The wet is such that they deteriorate?—Yes, it is far too wet for them. There are very few sheep bred in the Province; for that reason it is chiefly goats that are kept.

26269. Goats play an important part in the rural economy, do they not?—Yes, they are very hardy animals and there is very little trouble with them; we have really very little trouble with goats.

26270. Do the villagers consume the milk of the goats?—Yes.

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20271. They depend almost entirely upon goats for their milk-supply, I suppose?—No, there are big herds of cattle; they are dependent chiefly upon the cows for milk.

20272. On cows or cow-buffaloes?—The villagers depend on cows for their milk-supply, but in many places they have milk also from cow-buffaloes.

20273. What about the milk yield of the goat; have you studied that problem at all?—No, I have not.

20274. In some European countries where attention has been paid to the problem, extraordinary milk yields are obtained, as you probably know?—Yes. I do not think there are any big yields here; they are small milk yields.

20275. *Sir Henry Lawrence*: Is there any part of the Province which is well adapted for the breeding of cattle? Conditions vary very much, do not they, between the Brahmaputra Valley, the Surma Valley and the hills?—Yes, there are areas on the low hills where cattle could be bred quite well. The plains, of course, are flooded in the rains, they are swamps, and cattle cannot remain on them and remain healthy.

20276. Are cattle removed from the swamps during the inundation season?—In places where they can be they are, but in many places they cannot be removed at all, the cattle stand up to the hocks in water for about three months in the year; they have a little floating tub in front of them and feed out of that.

20277. Can they stand that?—A lot of them die.

20278. The mortality is heavy?—Yes.

20279. Do they suffer from mosquitoes?—Mosquitoes trouble them, and also ticks and leeches; they suffer a lot from parasites of that kind.

20280. After the cattle have died from the effects of the inundation season, you have to have fresh importation of plough bullocks and milch cattle?—Yes, there is a good deal of importation.

20281. Where are they imported from?—From the more favourable parts of the Province or from outside?—There is a large number imported from Bihar; those are bullocks for cart work. The local animal is used for ploughing in paddy fields, the ploughing being simply stirring up the mud, not heavy ploughing in the European sense; it is simply puddling up the mud.

20282. Do they use buffaloes for that purpose?—Sometimes.

20283. Not usually?—In some districts the buffalo works quite well and quite commonly too.

20284. You say that goats can flourish here. Do the Forest Department not object to their entering the forests?—There is a certain amount of objection, not so much to goats as to cattle entering some of the reserved forests, because they spread disease among the forest animals. There have been several heavy epidemics among the wild buffaloes and bison through animals carrying in rinderpest.

20285. But for the protection of the forest growth there are no special restrictions put on the grazing of goats?—No, no restrictions; but not many goats go into the reserved forests; they feed round the villages and in the paddy fields.

20286. Have you any particular policy you wish to press for the increase of the livestock, whether goats or sheep or cattle, which is handicapped by forest restrictions?—No, I do not think there is anything I wish to press on that point at all; in some places there is undoubtedly lack of grazing, but that could be remedied if we could get rid of half the herds. The villagers keep very large herds for which there is no use and a considerable number are useless through disease or old age. If we could get rid of those, there would probably be sufficient grazing for sound animals.

20287. The number of cattle in this Province is very much below the average, either per area or per head of population, of other parts of India?—Yes.

20288. Do you still think they are too numerous here?—I still think they are too numerous, yes; there would certainly be more food for the healthy ones if we could get rid of the diseased and unfit.

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26289. *Sir Thomas Middleton* : Have you made any observations of the effect of starvation on the incidence of diseases? Can you tell me whether rinderpest attacks the animals which are most starved or whether it attacks all cattle in an area when you get an outbreak?—Taking the example of rinderpest, rinderpest makes no choice; rinderpest will attack equally your well-fed animal or your poorly-fed animal; rinderpest is not selective in that way at all. A poorly-fed animal probably has not the same amount of resisting power against other diseases, but rinderpest is not selective.

26290. In other parts of India, I have had the answer that the starved cattle were those which disappeared in greatest numbers when there were attacks of rinderpest?—I have not found that.

26291. What is the position with regard to other diseases, for instance, foot-and-mouth disease?—We have a lot of foot-and-mouth disease in this Province. It breaks out two or three times a year; the mortality is very low. What kills the cattle are wounds or lesions which become flyblown, and the animals die of septicaemia; and, of course, poor animals out of condition have less chance of resisting poisoned wounds than fit animals.

26292. What breeds of sheep have you experimented with? Were they Indian breeds?—They were Indian breeds from Bihar.

26293. Were they bred mainly for wool?—Yes.

26294. Was there any evidence of their suffering from the parasite liver fluke?—We find liver fluke in the Province all over.

26295. Was the effect of the monsoon direct, that is, the result of a continuously wet fleece, or was it indirect through promoting the higher incidence of liver fluke?—It was both.

26296. Did you form any impressions as to which had the more serious effect?—The wet fleece kept the animals impoverished and the liver fluke finished them off.

26297. You mentioned also deaths among elephants. Have you any knowledge of the intermediate hosts of the parasites in that case?—We have not worked it out; but I think it is a similar host as in other liver flukes.

26298. Therefore you suspect some aquatic or semi-aquatic host?—Yes.

26299. That is why elephants cannot withstand disease in wet localities?—The elephant stands very much wet because it eats a lot of swamp grass. It is only when the disease is imported that it spreads to the herd. Wild elephants are comparatively healthy. Sometimes we get an animal badly infected, the infection escapes notice and it spreads. I am talking about tame elephants.

26300. It spreads rapidly?—Yes.

26301. While grazing on swamp grass, does not the elephant graze high up from the ground? It does not get to short grass and therefore it would not pick up infected snails?—The parasites escape from the snails and crawl up the grass stems.

26302. Has that been observed here?—That is only an observation from a study of the parasites affecting bovines.

26303. You mention the lack of bone in horses, and you refer to the comparative excellence of the Manipur ponies. Do you know whether there is limestone in the Manipur hills?—I think there must be, because the horses there have got better bone. The Manipur cattle are much better too.

26304. Are you sure that it is not a question of phosphatic deficiency rather than of lime deficiency? We are told that Assam is very deficient in phosphates?—I should think probably it is both acting together, deficiency of lime and deficiency of phosphate.

26305. The point has not been investigated?—No.

26306. Have you noticed in any district of Assam that the cattle suffer from depraved appetites?—Not markedly, but I have noticed some cases.

26307. You refer to the need for a research laboratory in Assam. You instance in that connection certain diseases. What type of laboratory have you in mind and what sort of workers?—A laboratory with one qualified man and a laboratory assistant.

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26308. I was rather struck by the diseases you instance, for example foot-and-mouth disease. You are aware that we are spending in Great Britain about two lakhs a year on the work of an expert committee investigating that disease?—That is a common disease, and a considerable amount of work has been done on it.

26309. You know the problems are extremely difficult?—It is a very difficult problem. It is being tackled elsewhere but still something might be done here.

26310. Similarly with regard to surra. How long ago was surra taken up in India by Dr. Lingard?—That is a matter of fourteen or fifteen years ago.

26311. It is a matter of thirty years ago, I think. That again is a very difficult problem. There must be a number of quite unknown diseases in Assam which you come across and find it difficult to explain; I should suppose that you had in view the preliminary exploration of these diseases?—The last disease that I have mentioned, nasal granuloma, took a considerable amount of our time, several years, to investigate. It began in a small way; there were only one or two cases; and it rapidly increased. We had no method of combating it, local treatment was of no use, and it was after experiment in Gauhati and one or two places that we started the treatment which was effective.

26312. I can see a great opening in a Province like this for the preliminary exploration of new diseases but some of the diseases you have mentioned could not be investigated in a Provincial laboratory?—I am only speaking about the foot-and-mouth disease.

26313. *Dr. Hyder*: The Khasis are not over-loaded with religion; are they?—No.

26314. They would not have any religious prejudice to inoculation of their cattle?—No.

26315. Has that been done?—The position is entirely different up in the hills here, because the Khasi does not use his cattle for work, and he does not use their milk. The only thing he gets from his cattle is manure. I am not talking about the Khasis in Shillong where they have changed their habits; I am talking about cattle in the Khasi Hills.

26316. He does not use cattle for ploughing his fields?—His fields are very small on the hill-side and are not adapted for ploughing.

26317. *Mr. Heslett*: The fact is that all the hill tribes are in the same position? In the Lushai Hills they do not use milk at all?—No.

26318. So the milk problem does not arise at all in the hill districts. In recommending special research in this Province, is it your idea to investigate the special diseases which cattle in Assam are subject to?—We can always do something like that. We want to study the diseases under local conditions. Our local conditions may differ from other Provinces. I think in a central institute we should work out the main idea, and then find out locally if there is anything acting in a secondary manner under local conditions.

26319. I suppose for our own special diseases a provincial laboratory might be necessary. But for diseases common all over India, such as the foot-and-mouth disease, rinderpest, etc., we need not undertake any research work in the Province?—I do not think so. It would be an advantage to have a laboratory for investigation of common diseases under local conditions and also of local diseases.

26320. *Sir James MacKenna*: Have you any magisterial powers to enforce segregation of cattle or the reporting of diseases?—None whatever.

26321. No Village Act in Assam?—None.

26322. Who reports cattle disease?—The head of the village or the panchayat. In the Surma Valley the village *chowkidar* reports to the Chairman of the Local Board. They are supplied with postcards for that purpose.

26323. Is it compulsory on them?—It is considered to be part of their duties, but they are very slack in doing it.

26324. I notice you complain of the delay?—There is a lot of delay.

26325. What is the cattle mortality in this Province from rinderpest?—Last year it was very heavy; it was one of our very bad years; the mortality was 30,000.

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26326. Is that a particularly high figure?—Yes.

26327. What is the average for five years?—About 12,000 to 15,000.

26328. I suppose the difficulties in the way of your exercising any internal control for the prevention of contagious diseases in this Province are two. One is the infection from the wild animals in your extensive jungles; is that important?—That is not important at all; the wild animals are comparatively healthy.

26329. And of course you have a big frontier line?—Yes.

26330. Therefore, you will want a very large frontier police to exercise any control?—Very few cattle come through a great part of the frontier line. That would not be a very big item. All along the north, in the Himalayan line, practically no cattle come down. Occasionally there are a few from Manipur and the Naga Hills, and we import disease from that part.

26331. Are many elephants kept by timber merchants?—Not in such large numbers as in Burma.

26332. They are very small owners?—Yes.

26333. There is no likelihood of the animals' owners subsidising research?—None at all.

26334. In Burma they have agreed to pay Rs. 20,000 a year for five years?—We have no chance of getting anything like that.

26335. You recommend the appointment of a Superior Veterinary Officer with the Government of India. How would you work that in with the Veterinary Service as a transferred subject? There will be very few references for technical advice and for research?—There are probably very few cases, but there is no one at present to appeal to when we have differences with local authorities in our scheme for veterinary work. I think it would be an advantage to have a higher authority to appeal to when veterinary schemes are neglected or objected to by local authorities.

26336. As a final court of appeal?—Yes.

26337. And, also, do you think that would extend research work in the Provinces? Do you think it would be a stimulus for provincial officers to take to research a little more?—It would be a stimulus, yes. But speaking personally, the provincial officer has very little time for research. The departmental work and professional work take up all my time. When we got a laboratory in each Province, it would be a stimulus.

26338. Where would you post the Veterinary Adviser?—At the headquarters; at Simla or Delhi.

26339. Not at Muktesar?—I do not think so.

26340. *Prof. Gangulce*: You want a well-equipped research laboratory; if you had one, could you find time to carry on any research work yourself?—There is a lot of research waiting to be done, but I have no time to do it.

26341. If you had a research laboratory, you would want to have a research worker?—Yes.

26342. Apart from yourself?—Yes, apart from myself.

26343. You have given us a long list of diseases; what particular diseases would the research worker undertake for investigation?—There are a lot of things I want to know more about. Starting with parasitic diseases, we found a new parasite last year, which we had not suspected before; it is a parasite which attacks the pancreas; it is known in China and Burma, but we had not seen it in Assam. I want to know how it got here, what is its secondary host and things of that sort.

26344. Are you in touch with the research work done in other parts of the country?—I am in touch, through professional literature.

26345. Are you aware that a certain amount of work is being done in Madras in connection with nasal granuloma?—Yes.

26346. Have you undertaken any study of the environmental and other conditions and the incidence of disease?—Yes.

26347. You mention here a list of diseases such as bovine infectious lymphangitis, nasal granuloma, etc. Of course, we know the parasites responsible for those diseases, and we also know their life history; but perhaps

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it will be interesting to study the environmental factors that are occasionally responsible for the prevalence and spread of the disease?—I agree that it is necessary, because the local conditions may vary considerably from one Province to another.

26348. Have you undertaken any study in that direction?—Now and again, we find out that in certain districts certain diseases are more prevalent than in others in this Province, because of the local conditions of keeping the animals. In the flooded areas, when they are kept on small artificial mounds and things of that sort, certain diseases increase; whereas, if they had wider grazing grounds, the disease would take a longer time to catch hold of the animals.

26349. If you had a map of Assam before you, could you tell us which particular parts are more affected by rinderpest than others?—I think rinderpest is practically uniform all over Assam. Of course, it is much more virulent in the hill districts than in the plains districts.

26350. Have you any periodicity in the diseases?—In rinderpest there is a periodicity, every fifth or sixth year we get a much heavier outbreak and the disease seems much more virulent; we cannot account for it.

26351. You have just mentioned something, in answer to Mr. Hazlett, about local diseases; what local diseases have you in mind?—The local one is the parasitic disease which we found last year.

26352. Any new one?—That is the new one; we found it out last year; it is comparatively local to an area of two miles square. We have not found it anywhere else; it is very localised.

26353. You do not know the parasite responsible for that disease?—We know it, but we do not know the factors and the intermediary hosts; we do not know the mode of infection at all, it must be through a swamp animal like the snail.

26354. For veterinary education, you send your students to the Bengal Veterinary College; what is the arrangement you have with the Bengal Veterinary College?—A certain sum of money is provided by Government, and we send down a certain number of students. I forget what the sum is. There are six stipendiaries down there now. We give them a monthly stipend of Rs. 20.

26355. Are they all sent by Government, or are any sent by Local Boards?—At present they are all sent by Government, and there are none from the Local Boards. In previous years, there were a few Local Board students, but the Local Boards found it very expensive, because the Bengal Government put up the fee, since then the Local Boards have sent up no men.

26356. In making a selection of these stipendiary students, what qualifications do you seek? Are they matriculates?—We try to have matriculates, but I put very much more value on a man accustomed to work with animals, who has a knowledge of animals, and who is interested in animals; if his standard of education is up to the high school standard, I would rather send him than the matriculate from the town.

26357. When they finish their studies, are they bound by any contract to serve you?—They are bound by contract to serve us for a period of five years.

26358. Do you appoint them as Inspectors?—No; we appoint them as Veterinary Assistants on probation.

26359. On what salary?—Rupees 50 a month, which is the old scale; a new scale of Rs. 55 per month has just been sanctioned.

26360. What are the duties of the Veterinary Assistants? What kind of jobs are they put on after completing their studies?—They come on the reserve at Gauhati, they work in the veterinary hospital there for some time and learn a lot about their duties, namely, the keeping of books and records and how we want them to work in connection with inoculation and general treatment.

26361. What are the duties of the Inspectors?—The inspection of dispensaries and of Veterinary Assistants' work in the field, and the checking of inoculation results; they have also other duties under the Glanders and Farcy Act.

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26362. You have a Glanders and Farcy Act in the Province?—Yes.

26363. Are you able to control the disease under the provisions of the Act?—We have been able to control it so far, because the horse population is not so great.

26364. You have adequate staff for the purpose?—It is adequate for that particular disease; more staff is required for surra which comes under it.

26365. Who does the inoculation work; the Inspectors or the Veterinary Assistants?—The Assistants do the inoculation work.

26366. What is the process of castration which you have adopted? Is it the Italian process?—We have adopted the Italian process. I think Assam was the first Province to adopt this method, because I happened to be in England when the instrument was first introduced there. I brought one down with me here, and wherever we introduced it the people were keen on it. It has certain advantages; it is painless and it causes no wound, which means no dressing and no risk of contamination.

26367. You say, "Contagious diseases are often deliberately spread by 'chamars'." Is there no way of prosecuting such cases?—We have tried to do it over and over again, but it is difficult to get evidence.

26368. In this list, I find that the number of animals treated for contagious diseases is 18,000, and the number of animals treated for non-contagious diseases is 18,000; what are the chief diseases under the head 'Non-contagious'?—There are very many indeed; you can start with the ordinary ones and go on to diseases of the foot, of the digestive system, of the respiratory system and diseases in connection with calving and things of that sort.

26369. How long have you been in this Province?—About twenty years.

26370. Do you think that deaths from epidemics of contagious diseases are increasing?—I think the deaths are fewer.

26371. What interest do the local bodies take in veterinary matters?—Some of them take a good deal of interest; the Chairman takes an interest in the Veterinary Assistant's work and sees about his touring and the work generally. In some cases, they take a considerable amount of interest, but in some other cases they do not.

26372. You have to tour a great deal to inspect the work of your Assistants?—I have.

26373. *Mr. Calcutt*: Are questions of animal husbandry dealt with by you or by the Agricultural Department?—By the Agricultural Department.

26374. You have nothing to do with it?—No.

26375. Do you think they should be dealt with by the Veterinary Department?—I think sometimes it would be an advantage if they were, but I have too much work to do, to do anything in connection with animal husbandry. I give them advice when they seek it at any time, but that is about all that I do.

26376. If a Livestock Expert were appointed, you would not desire that he should be put under you?—I do not think so. I have only got to do with diseases at the present moment. I control any diseases on the Government farm; I have nothing to do with animal husbandry otherwise.

26377. On the general question do you regard officers of the Civil Veterinary Department as competent cattle-breeding experts?—I think all the officers that have been trained in England are, but I do not think that officers trained in India have very much idea about it.

26378. *Rai Bahadur R. M. Das*: Will you kindly tell me what veterinary education you had?—I was trained in Edinburgh for the diploma of the Veterinary College. I had six months' training in the University of Birmingham Laboratory, and three months' training in Tropical Medicine in London.

26379. Do you hold any degree?—I hold the degree of M.R.C.V.S.

26380. Will you please tell me whether you had any practical experience in veterinary matters in any other part of India before you joined the present post?—The only experience I had was in England and Scotland.

26381. Not in this country?—I had no experience in this country before I joined my present post.

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26382. You have told us that you have been here for the last twenty years?—Yes, approximately.

26383. Do you consider the diffusion of veterinary knowledge very necessary in rural tracts?—I think it is very necessary indeed, for the improvement of the cattle and to reduce the heavy mortality.

26384. What lines do you suggest for the diffusion of veterinary knowledge in the rural tracts?—At the present time, we have Veterinary Assistants touring and treating animals in the villages. This has been our practice for the last twenty years, showing them how animals should be treated. The Veterinary Assistant advises them how sick animals should be looked after and the value of segregation in the case of infectious diseases and questions like that. To give you an example how knowledge is being diffused. A man had seen my Assistant taking blood when his cattle were ill. After some time his own cattle became sick; so he got a bit of broken glass and took a few drops of blood and came into the laboratory with it. He thought that this was an important thing to do. That is just to show how knowledge is gradually spreading even in the remotest places.

26385. What do you think of introducing lantern lectures?—I think they would be very useful indeed provided you had them on the right subject.

26386. Do you think it would be desirable to provide your touring Veterinary Assistants with lantern slides?—I should not suggest the Assistants, but I can suggest the Inspectors for doing that work.

26387. You think that if your Inspectors were provided with lantern slides they would be able to do some useful work in the way of lecturing on veterinary subjects?—I think it would make the people more interested in the subject.

26388. Have you made any suggestion to your Government to that effect?—I once suggested something to that effect but on account of financial stringency the matter was turned down. I have not done so lately.

26389. But the finances have improved since then. Do you not think that a suggestion like this would be very useful?—I have been thinking recently, again, of arranging for a certain amount of lecturing work at fairs and shows. We have a veterinary stall with specimens and some diagrams and we also show instruments there. So if we can have lanterns there also, it would be a very popular part of the show.

26390. Here is a proposal which I will read out to you. Mr. Scott, Director of Land Records, suggests, "Instead of appointing Veterinary Assistants in all places, I should recommend the starting of a certain number of qualified practitioners, with a lump sum grant sufficient to cover the initial cost of instruments and a modest dispensary building, and a diminishing stipend sufficient to maintain a practitioner in moderate comfort at first and then diminishing it to nothing at the end of five years, by which time he might have sufficient local practice to carry him on." Do you think such a proposal is feasible?—At the present time it is not feasible because the ryot would not employ the Assistant even on a small fee of 4 annas; so if you had a veterinary private practitioner he would starve. He could not live on his private practice at the present time. I do think however that in course of time (probably in the next twenty or thirty years) the local cattle-owners would be forced to come to the private practitioner for advice and assistance.

26391. Mr. Calvert: What happens to a man if you dismiss him?—They have tried private practice over and over again but they cannot make a living out of it; they would have to do something subsidiary.

26392. Rai Bahadur R. M. Das: You say that the Local Boards are unable to provide funds for the increased demands for Veterinary Assistants?—That is so.

26393. Do you think that these Veterinary Assistants should be financed by Government? What do you think of the idea of the staff being provincialised and only the cost of the dispensary building and medicine being charged to the Local Boards?—That might be one scheme. I think that if the Local Boards contribute a certain amount of money towards the cost of the Veterinary Assistant, they will probably take more interest in the man.

26394. Nowadays you charge two-thirds cost of the Veterinary Assistants to the Local Boards but they have not got sufficient funds to provide more

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Veterinary Assistants whose services, you say, are very necessary and are in increasing demand. That being the case, I suggest that the Government should pay for the whole staff and Local Boards should pay for the medicine and buildings and other extra expenses?—That would be a very heavy demand on Government. I do not know if any Government would be able to pay so much for veterinary work.

26395. You consider the increase of the veterinary staff to be very necessary in the interests of the rural population?—Yes, I consider it very necessary.

26396. Then how are you going to increase the staff to meet the increasing demand?—First of all, the Local Boards must be able to pay for more men.

26397. But they have pleaded their inability to do so; they are bankrupt and are unable to pay. Do you not think that the mortality among cattle is very heavy in this Province? It is very heavy.

26398. Then how are the Government going to meet the situation?—I cannot say.

26399. Is there any difficulty in getting a sufficient number of Veterinary Assistants now? There has been some difficulty in getting suitable men in the past but the pay has now been raised and I think that in the future there will not be the same amount of difficulty.

26400. In order to get a sufficient number of Assistants, do you consider it desirable that a few more stipends should be granted by Government?—Yes, a few more stipends should be given.

26401. And the present number should be increased? We give six stipends at the present time.

26402. You think that more stipends should be granted?—I think the number should be increased a little more.

26403. *Mr. Hazlett*. In addition to getting literature on veterinary subjects, you also go to Muktesar occasionally for a refresher course and you keep up your knowledge in that way? I went to Muktesar in 1922 and I found my stay there very useful.

26404. I suppose, when you go on leave you also keep yourself in touch with veterinary work at home?—I do.

26405. *Sir Thomas Muirhead*: Could you tell me what is the percentage of recovery in case of severe attacks of rinderpest?—The mortality may vary in a severe attack from 90 to 95 per cent.

26406. So there is only a 5 per cent recovery?—Yes.

26407. What is the percentage of mortality in an ordinary attack?—In an average attack it is from 15 to 50 per cent.

26408. Have you noticed in the case of an ordinary attack that the recovery is better among the less starved animals than it is among those which are emaciated?—I think the emaciated animals have a greater chance of dying than the stronger animals.

26409. Then there is some selective effect exercised by rinderpest in the case of an ordinary attack?—I do not think it is a question of selection of disease; it is a question of the vitality of the animal.

26410. I said "selective effect", that is to say, the percentage of recovery will be greater among the better treated animals than among the more starved animals?—I admit that the more starved animals will succumb more readily, but the mortality is still high among the well-conditioned animals.

26411. On another point. We have been discussing the question of the veterinary laboratory from the point of view of the requirements of Assam. You have been asked questions as to the diseases which you would take up. You are aware that, even in countries like Great Britain, new diseases frequently appear, for instance, we have got grass sickness in horses which is being investigated at present. Would you agree that, from the point of view of veterinary research, Assam offers almost ideal conditions for an investigator. You have got a large number of animals which, from a stockbreeder's point of view, would be regarded as being grossly mismanaged. You have a heavy rainfall, swamps and jungles; and therefore you must have any number of diseases awaiting investigation by research workers?—I think so. We have got a disease in horses which carries off a tremendous

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number of them every year. The value of horses which died from this disease last year must be something like Rs. 40,000 to Rs. 50,000, and we know nothing about it.

26412. You have been working in this Province for the last 20 years, and yet I suppose you will agree with me that there must be a good number of diseases which even you do not suspect to exist in Assam but which are present in livestock?—I do not think there are very many; there may be some.

(The witness withdrew.)

**Mr. J. R. CUNNINGHAM, M.A., C.I.E., Director
of Public Instruction, Assam.**

Replies to the Questionnaire.

QUESTION 23.—GENERAL EDUCATION.—(a) The existing systems of education in this Province have no direct bearing on the agricultural efficiency of the people.

(b) (i) In the elementary stages rural education in schools can have little influence on agricultural practice. The main business of primary schools is to teach children their letters; and this is a task more than sufficient for the majority of the teachers. I subjoin extracts from the last Quinquennial Review of the progress of education in Assam:—

(1)

“In this province it is needless to attempt to make elaborate courses compulsory in their fullness and complexity. The task of teaching the simplest course is more than complex enough. Ordinarily the village schoolmaster, ill-found in vitality and learning and depressed by poverty, is in sole charge of a school of five classes or sections which he has to instruct in all the subjects of a varied course. There is no fixed date of admission. Pupils come in month by month according to caprice or the influence of their horoscopes. The lowest class, a class in which numbers are high, is a collection of little groups, each at a different stage of advancement. And there are four classes above this.

“Again, with an attendance of 70 per cent on the average which sinks lower during seasons of flood and fever, the teacher is faced by a different selection of his pupils every day. Unpunctuality adds to his difficulties. In the case of rural habits, the absence of clocks and the defect of discipline, unpunctuality is the rule, the arrival of pupils being spread over a period of an hour to an hour and a half or even two hours.

“It would seem necessary under these conditions that courses should be reduced to the elemental bone.

(2)

“What are we to teach, what are we to teach our teachers to teach, in village schools? The administrative views as regards the compulsory course favour extreme simplicity. Teach the three R's and what little else you can, but teach the three R's. For the rest, encourage the teacher's interest in subjects such as handwork which help in his work and make but little call on his energy, and discourage subjects which are and must for the present remain outside his ken. The plain man on the other hand is insistent in his demand that the course should be made practical. Children must be taught in their nonage and infancy, trades, cottage industries, hygiene, nursing, cooking, first aid, co-operation, agriculture, epidemic medicine and so forth (this is not an imaginary list). When they emerge, still in their pupilage, they will call industries from the vasty deep and will use their knowledge of all things proper to the business of life to regulate the conduct of their parents and the village elders.

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"Assume these things possible with the children, it is still to be considered where we are to find the accomplished persons who are to teach them and, being found, how we can sufficiently remunerate them.

"We hear much nowadays of child psychology and the conditions of child life. It is time that we took into more equal consideration the psychology of the teacher and the conditions in which he has to work. Constantly it is found that too much is expected of the school and too little thought of the teacher."

In middle schools also but little can be done. The numbers attending such schools are insignificant compared to the main body of the agricultural population. The only course therefore which could

be useful in a large way would be so to teach middle school pupils that those of them who returned to the fields would act as leaders or exemplars. But this is beyond possibility in what is still an elementary course. No more could be done than to associate instruction with labour and with field interests in such a degree as to prevent pupils on their return to the fields from being handicapped by their schooling. This would be a difficult enough achievement. It would not be an important achievement. And, if it affected adversely the cultural value of the courses for the generality of the pupils, it would be effected at a cost which could not easily be justified. For in pursuing their education beyond the primary stage the desire of pupils, or of guardians on their behalf, is to escape from the ill-found and despised existence of the cultivator.

By the time they have completed the middle school course pupils may have acquired a sufficient grounding in

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general knowledge to profit by elementary scientific instruction in agriculture were this to be included in the secondary school course. But here again only the difficulties are plain to me—

- (1) Pupils are not to be found who are educated up to this stage and are willing at their own cost to undergo agricultural instruction.
- (2) Teachers are not to be found who are capable of training pupils to the practice of agriculture in Assam so that they will be assured of greater success as agriculturists than if they had been associated with the land from childhood and had not gone to school at all.
- (3) If the aim is to be to interest the middle classes in agriculture as farmers rather than as cottar-ploughmen, how are the pupils to find (a) land, (b) capital, (c) labour?

Before anything important can be done in schools to speed the plough, it would seem that these precedent conditions must be satisfied:—

- (1) The public interested in secondary education must have been brought by persuasion or distress to the point at which they will refuse to give their children an ordinary high school education because no sort of salvation is to be found thereby.
- (2) The way must have been prepared to the realisation of a larger and a more prosperous life through agriculture than is at present possible.

The first condition is on the way to being satisfied. The second may come into view as the outcome of the labours of the Commission.

We might possibly get ready for the time when schools will be asked to co-operate. Just how this is to be done is no easy matter to decide. It is not difficult of course to throw out suggestions on paper. But it is difficult to have confidence in them as practicable measures, or, even if they are well conceived, to have faith that others will have the confidence necessary to lead them to success.

Subject to these doubts, I put forward the following views for what they may be worth:—

- (1) The first step must be in colleges where we must prepare the men who are to lead the new movement.

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- (2) Under the conditions prevailing in this country it is essential that to begin with at least the courses to be taught should be a compromise. They must lead to the issue of a degree or degrees. The degrees must qualify men for the various departments of Government service as fully as the present degrees. This should not be difficult. It would be necessary for example to concentrate on English. And—*this is crucial*—there would have to be a definite and sufficient reservation for the graduates of appointments in the executive and other branches of the public service.

Under such conditions admission to the new courses might be by competition. If a reservation of appointments were not made, the agricultural college might whistle for students. It would not get them.

The appointment of lecturers, etc., would have to be made solely with an eye to efficiency. The course would have to abjure the Dream and come down to the Business, facing the facts of the agriculture of this Province and not of another Province or another country or the world in general—the soils, the climate, the people, the flora, the pests, the economic and social conditions of Assam.

Should some such course be practicable, we should have in time a body of men interested in agriculture and knowledgeable on the subject who would be able to help in offices, in schools and on platforms when the time was ripe. At present, we have no body of men and but few individuals who are capable of giving lessons in nature study in a primary school. In our colleges the natural sciences, as distinguished from the biological, have been the only wear. Our graduates are ignorant of the simplest facts of life.

(b) (iii) I subjoin an extract from the Quinquennial Review already referred to:—

"It is to be expected that, in such circumstances, we should have a class of uncertain folk intermediate between those who do not want education and those who do. When those who do not want education are an overwhelming majority of the population, it will follow as a matter of course that those who are uncertain bulk much more largely than those who are certain. As the disproportion between the masses and the elect decreases, the so-called wastage will also decrease. The problem of reducing wastage is in its main aspect no other than our old friend the problem of breaking down illiteracy.

"The uncertainties of to-day are the certainties of to-morrow. And the money spent on them is well spent in the process of pushing back the margin of educational cultivation. . . .

"This does not, of course, rebuke educational authorities of the necessity for preaching the cause of education by works, doing whatever can be done by persuasion, by more efficient organisation, by improved methods and so forth to keep children longer in school and, so far as such measures can do so, to hasten the general process of conversion. But it does change what has been used as an argument for reaction and for the reduction of educational expenditure as being largely unprofitable into a very powerful argument for the increase of expenditure and the redoubling of endeavour to carry the campaign more widely afield. There is no school however stubborn in its illiteracy which does not convey some message of hope. The most backward are the outposts of progress. . . .

"It is not generally realised what an important part the economic argument plays in regulating the average duration of school life amongst the children of the poor. Briefly elementary education, even if it be free, as it is in Assam, is expensive. It costs money and brings in no return. A modest estimate of the cost of school books and materials rises from one rupee odd in class I to four or five rupees in class IV : estimates of the whole costs, including clothing and umbrellas, rise from Rs. 25 to Rs. 50 and, even if these latter estimates are excessive, yet, being halved, they still offer a formidable barrier.

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"It is one thing to keep a child at school for only a single year, quite another not to send it to school at all. Many of those who have no strong faith in the value of education yet regard it as respectable to send their children to school. In good times, therefore, we should expect to see such parents keeping their children longer at school than in bad. In bad times, we should see them withdrawing their children early, and this tendency would manifest itself more strongly than the tendency to withhold them from school altogether.

"To sum up, the main reasons for wastage are the poverty and the ignorance and conservatism of the people. The remedies are time, the expansion and improvement of education, and a progressive policy in the matter of roads, railways, and economic and social development. Postulate a vigorous policy of educational advance, and every measure that conduces to the well being of the people help towards the reduction of educational wastage.

"A word in conclusion. The solution which is so frequently put forward of popularising schools by adapting rural education to rural needs has little or no meaning in the absence of an agreement as to rural needs between the rustic and the reformer. The reformer has in mind the introduction of utilitarian studies such as agriculture into the village school course. The rustic sends his child to school to learn to read and write. He has no doubt of the fact that the village *guru* knows less of agriculture than he does himself and what the boy needs in the matter of agricultural knowledge he can learn by doing in the fields . . ."

Oral Evidence.

26413. *The Chairman* : Mr. Cunningham, you are the Director of Public Instruction in the Province of Assam?—Yes.

26414. You have provided the Commission with the note of evidence which you wish to give before us. Would you like to make any statement at this stage or shall I proceed to put a few questions?—I have no statement to make at this stage.

26415. Where are your teachers trained in this Province?—Secondary teachers are trained out of the Province, namely, in Bengal; vernacular teachers are trained in our provincial institutes.

26416. Are you satisfied with this arrangement?—No.

26417. Does this arrangement meet your demands as they exist at the moment?—I should not say so; we should be very much better off if we could afford to train our men altogether in our own institutions.

26418. Does any expense in having them trained in Bengal fall on the Province?—We pay the proportionate share of the cost of the institution in which they are trained.

26419. Is that charge a good deal less than it would be if they were trained within the borders of the Province?—Yes; it would probably cost twice as much to have them trained locally.

26420. In your note I am interested to see that you attribute a good deal of the unpunctuality of school children to the absence of clocks. On what do the rural population depend for their time? Do they depend on the sun?—Yes. If I may say so, it is not a matter of the absence of clocks in the schools so much as the absence of clocks in the home.

26421. I think you make a remark on page 146 in answer to our Question 23, which is important. There you say that a great deal has been heard about the child's psychology and the conditions of child-life but not much about the conditions in which the teachers work. I suppose a large proportion of your teachers in this Province are crippled, as it were, during the greater part of the year by ill-health on account of malaria?—Yes.

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26122. Are your schools in many cases closed during the malarial season?—No.

26123. Do you think the receptive powers of the children are greatly reduced by the incidence of disease?—I am afraid I cannot answer that question. I suppose that both in the case of pupils and teachers the vitality is depressed.

26124. I thought you might have formed some view as a result of comparison between the receptive nature of the children in the hills as compared with the children lower down, where malaria is more prevalent?—The children in the plains are ordinarily quite receptive enough.

26125. I see you are quite definitely of opinion that literacy should be the objective in the primary school, and that there should be no attempt to inculcate agriculture as vocational training?—In the primary schools I think that should be definitely set aside.

26126. You do apparently see some hope that it may be possible to devise a system of middle-school education which will improve the individual as a cultivator without causing him to turn his back on the land. Such a system has not yet been discovered, has it?—I can scarcely say any hopes run high with regard to that. All I have said is that no more can be done than to associate instruction with labour and with field interests to a degree which would prevent them being handicapped. I do not think I have gone much further than that.

26127. I do not, of course, want to put words into your mouth you have not used. Do you find any tendency on the part of parents in rural areas to attribute importance and value to education for their children in so far as that education improves the value of the child as a potential cultivator?—I do not think so at all.

26128. Where the desire for education exists, it exists for education as a door to another life; is that the position?—I think so.

26129. Have you anything to tell the Commission about adult education as a possible means of inculcating literacy?—We have not done anything with regard to adult education yet in this Province, and all I know about it is what has been done in the Punjab, where I believe successful experiments have been undertaken.

26130. Do you think a large number of children in this Province who have once attained literacy lapse into illiteracy?—I do not think so, though of course large numbers who have attended school do.

26131. That is quite a different thing?—Yes. Those who have attained literacy largely maintain it.

26132. How about female education in this Province?—It is very backward indeed.

26133. The Missionaries in this part of the Province have achieved considerable success, have they not?—Yes, in the Khassi Hills female education is very much more advanced than in the plains.

26134. Is public opinion moving at all in the direction of demanding female education?—Yes, it grows very slowly. Ten or eleven years ago there was not such a thing as a girls' high school; now we have three or four. But things are moving very slowly indeed.

26135. Do you think more could be done to stimulate that movement?—It would be very difficult. I think we have got to bide our time.

26136. Let it come naturally?—Yes.

26137. You point to the inadvisability of overloading the programme of education, but is it not your view that something might be done to teach children elementary rules of health and hygiene? Perhaps it is being done in this Province?—It is being done, yes.

26138. With what result?—It is a little difficult to say. We have had teaching of that kind in force for thirty years, but I think the result is hardly noticeable. Children learn more by example than by precept.

26139. Take the example shown by the school itself. How about the cleanliness (or the reverse) of the sanitary arrangements provided in the school?—In the primary schools, there are no sanitary arrangements of any kind.

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26440. Is it much use trying to teach children (who, you have just said, learn more by example than by precept) if no such rules are carried out at the school where they are being taught? What is the difficulty? Is it a question of inspection?—I think it is really a question of the faith of the people in general.

26441. I was referring to the particular difficulty of providing sanitary accommodation in schools and maintaining it in a cleanly and efficient condition?—That is quite out of the question.

26442. *Prof. Gangulce*: Are you of opinion that the voluntary system of education has failed in India?—No, by no means.

26443. Do you think the time has come for compulsory primary education?—General compulsion?

26444. Yes?—I do not.

26445. You think public opinion is not ripe for it?—I think public opinion is not ripe, and public opinion depends largely in this matter on the social and economic condition of the people. I do not think they are able to afford it.

26446. But there is a growing desire for it?—There is a growing desire for it on the part of the leaders of the people, but not, I think, on the part of the people themselves.

26447. Would you say the general public opinion of England was in favour of measures for compulsory education when they were enacted in that country?—Yes, decidedly.

26448. On page 140, in reply to Question 23, you say the first stage must be in the colleges, where you must prepare the men who are to lead the new movement. Can you explain why leaders are not forthcoming?—It is largely a matter of education. We have not men who know anything about the subjects which would require to be taught. In the Indian colleges the natural sciences have excluded the biological sciences altogether. A man who knows anything about botany or biology is rare, and when he does know anything about them he does not know about them in reference to local conditions; he has simply got up some knowledge from Western text-books.

26449. It is the deficient system of education; is it not?—Yes.

26450. What fundamental changes would you recommend in consequence in college curricula?—So far as the ordinary college curriculum is concerned, I do not know that there are any fundamental changes I would recommend.

26451. Would you introduce rural economics as a subject?—I do not think so. It is not worth while fiddling with the subject by attempting to give a mere tint of agricultural learning to the general courses.

26452. You would have special agricultural colleges for the purpose?—Yes, decidedly.

26453. In each Province?—Whether we started with one in each Province or with a central institution having affiliated institutions in each Province does not matter very much.

26454. You would not attempt to develop an agricultural outlook in the general course?—No. I think that is quite impossible until you have produced the men and the circumstances which would encourage the outlook.

26455. You say that if a reservation of appointments were not made the agricultural college might whistle for students; it would not get them. Could you specify the branches of the public service in which you think reservations might be made?—Particularly in the executive services, and in the educational; in fact, in every service for which a general training, as distinct from a professional training, was required.

26456. *Mr. Calvert*: You seem rather pessimistic about the chances of spreading rural education?—I am not pessimistic as to the possibility, but I am not very clear about the probability.

26457. Is your view based on the deficiency in the teachers?—Yes, partly.

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26158. It has been represented to us that the good teacher is more important than the good curriculum?—That is so, undoubtedly.

26159. And that, if an agricultural bias has to be given to primary education, it should be given to the teacher rather than to the curriculum?—I do not think you will be able to give an agricultural bias to elementary education until elementary education becomes more general. While it is the privilege of the few, the bias is bound to be away from the fields.

26160. That is a common experience all over the world; but it is not a necessary element in education that it should be anti-rural?—No.

26161. Can you make any constructive suggestion for attaining this ideal of what every one calls a suitable type?—The only practicable suggestion is to develop education and make it more general, and to train the men who will be able to help matters forward. The people who decide to educate their children are those people who are looking away from the field, or at any rate they are educating themselves to the possibility of a turn-away from agriculture.

26162. That is to say, there is no desire for primary education for its own sake?—It is difficult to be so definite as that. There is a certain desire for primary education for its own sake.

26163. Are you able to meet all the requests for new primary schools?—No.

26164. Is the drive for extension at present coming from above, that is from you or your department, or from the people?—From the people.

26165. Have you any system here whereby your teachers attend any courses in rural economy such as settlement work and land revenue?—No.

26166. Could your teachers help the cultivators to understand the village revenue papers?—You mean the ordinary primary school teacher?

26167. Yes?—Yes; I think he could.

26168. Does he understand the methods by which, say, the land revenue is assessed?—It is difficult for me to be very definite on the point.

26169. The point I am driving at is the extent to which the teacher is a friend of the cultivator or merely an outsider thrust into the village?—Wherever possible, we try to find a teacher from among the villagers themselves. As far as possible, the men selected are appointed in their own villages, because the pay offered to them is not sufficient to enable them to live elsewhere.

26170. Because it is practically useless trying to give an agricultural bias to the curriculum if the teacher takes no interest at all in agriculture?—Yes; with inefficient teachers it is very difficult to get on.

26171. Are your teachers mostly drawn from the cultivating classes?—They are drawn from all classes.

26172. Do you make every effort to get the largest proportion from the actual agricultural classes?—No; we simply take what we can get.

26173. It is not part of your policy?—No.

26174. Can you suggest any means whereby the leakage between the first and the fourth classes could be reduced?—There are many means. You mean something sudden?

26175. You drop about 80 per cent between classes 1 and 4 and only 14 per cent survive?—Yes; general compulsion would settle the matter at a stroke, if the compulsion could be enforced.

26176. But it would not because you have not got teachers?—Yes; let me qualify that by saying "so far as we can provide teachers." For the rest, with more money generally, with better qualified teachers, with better pay, one might envisage the possibility of a modified form of compulsion. For example, one might say in a certain area, "we do not consider that you are sufficiently advanced for general compulsion"; but there is no reason why we should not introduce compulsion combined with voluntarism, that is to say, we should say to children who go to school,

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or rather to the parent, "we do not force you to send your children to school, but if you do send them they will have to stay for the full four years or five years as the case may be."

26177. Under penalty if they do not do it?—Exactly; the same penalties as in the case of the ordinary compulsory education statutes.

26178. Now, in your reports and comments do you judge your staff by the number of pupils on the rolls or by the number of pupils in the fourth class?—Neither, I think.

26179. But do you not think that you will get better results if you concentrate entirely on the number of pupils in the fourth class?—No; this would be to neglect the material which is to constitute the fourth class.

26180. But they have got to pass through the first three classes to reach the fourth class?—But if you concentrate on the fourth class, the teacher concentrates on the fourth class and he neglects the material which constitutes the fourth class.

26181. But your promotions are made subject to the Inspector's approval, are they not?—The Inspector is the general supervising authority, yes.

26182. He does actually check the promotions from class to class?—Yes.

26183. So he could check that risk?—Yes; but the pupils who need least attention are those who are most advanced and, if you concentrate the teacher's attention on them, you are spoiling your school. The pupils on whom you should concentrate most are the pupils at the bottom.

26184. You do not think there has been too much attention given to the gross total on the rolls and insufficient attention paid to the literacy?—No; we had for long in this Province a system whereby the teachers were paid according to the number of pupils in the upper classes, that is to say, the teacher would get his ordinary pay and also what is called a capitation grant, the grant increasing with the number of pupils in the higher classes; but it was quite ineffective.

26185. It was discontinued?—Yes; it bred dishonesty and did no good.

26186. The teacher again failed?—Yes; he tended to concentrate on the upper classes and to neglect the sources from which he derived his upper classes, namely, the lower classes.

26187. The main object of your primary education is literacy?—Yes; that is so.

26188. For your ten lakhs, which you say you are spending a year on primary schools for boys, do you think you are getting good value?—Yes.

26189. Is not a lot wasted on the 85 per cent who do not attain literacy?—I do not think it is a waste. It is from these pupils who do not go forward that we derive, year after year, in gradually increasing numbers, the pupils who do go forward.

26190. It is a very expensive way of achieving the object?—If we had what we could have for 10 lakhs, the total costs more, compared to the results obtained.

26191. Does your department work in close touch with the Co-operative Department?—No, not at all.

26192. Do they give lectures in your normal schools?—No.

26193. Do you insist on co-operative societies in your normal schools?—No; we tried them but without success.

26194. Have you tried anything approaching the compulsory education society of the Punjab type?—No; we got our Compulsory Education Bill passed only during the last Council Session; we have not yet framed rules under that Act, so that compulsion is not yet in force at all in this Province.

26195. In the Punjab we have a close touch between the two departments all along the line; do you not think you might get good results by some similar measures here?—I am afraid I cannot say. If I had thought so very definitely I should have moved in the matter. I do not think it is impossible that we should secure good results by co-operation between the departments; I think it is possible. But I do not just see in what way we should move.

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20496. I think I am correct in saying that the Education Department in the Punjab sets a very high value on the compulsory education society which is a step towards general compulsion?—Yes.

20497. Do you think there is any hope of a similar compulsion here?—I am afraid I cannot say. We have not got compulsion introduced here at all. I am very doubtful of the value of compulsion in India, that is, the value of general compulsion in any area, so I would rather not express an opinion on the value of that.

20498. The teacher being the basis of the whole is there no way out of this *impasse*? You cannot make progress without better teachers?—No; I do not think there is; you have got to have your teachers and you have got to be able to pay them. At present we pay our primary school teachers very very poorly.

20499. But do you think the defects in the teachers are due to the fact that your salaries attract the poor class of men, or are there not good men with the necessary qualifications?—The reasons interact, I think. There is a dearth of suitable men; but if we had more money all round, more money for training, more money for teachers, more money for respectable schools, for buildings, repairs and so forth, we should have better schools.

20500. Would you mind looking at page 148 of your note? You give there three main reasons of wastage. In that paragraph you omit all mention of the teachers. Do you not think that the teacher is the chief cause of wastage?—I think it is secondary; if the people cease to be ignorant, cease to be conservative, you naturally get a different class of teachers. The teacher, if I may say so, is lurking behind this paragraph.

20501. He is the main cause?—Not a primary one; naturally if we had better teachers we should probably have less wastage.

20502. If you could get an ample supply of very good teachers, roads, railways and buildings would be less important?—Yes; that is undoubtedly so. The quality of the teacher, if I may say so, is the natural outcome of the state of progress of the people. You cannot have a backward people producing a host of capable teachers. If the people are progressive, then you may expect the teachers to be progressive also. If the people are backward and depressed, then the teacher also would be backward and depressed as a rule.

20503. For these defects in the teachers, is not the system of training of the teacher responsible?—It is really difficult to know where to begin. The system of training is not bad; our training schools are fairly good.

20504. *Sir Henry Lawrence*: What pay does the ordinary primary school teacher get?—Rs. 12.

20505. Is it fixed or varying?—There is no definite scale. Rs. 12 is the minimum; it may possibly run up to about Rs. 20; not more than that.

20506. Do you expect to get good material on that pay?—I think the pay should certainly be higher.

20507. *Mr. Calvert*: You see the results of the work of this Commission depend very largely on education?—Yes.

20508. Education depends on teachers?—Yes.

20509. If you say the material is bad and you cannot get good teachers, there is very little prospect of agricultural improvement?—Yes.

20510. But do you really think there is very little hope of any considerable improvement in the general standard of education in this Province in the immediate future?—I think there is no hope at all unless definite action of some kind is taken, unless something radical is done.

20511. *Rai Bahadur R. M. Das*: There are two kinds of education; there is education as a preparation for life such as is imparted in our schools and colleges, and, there is education the purpose of which is to train up young people to be better men. In your note are you referring to the first or the second kind of education, or to both?—Where?

20512. You say, "The existing systems of education in this Province have no direct bearing on the agricultural efficiency of the people."

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Are you there referring to the first kind of education, that is, education as a preparation for life such as is imparted in our schools and colleges?—Yes.

26513. Then there is another kind of education the object of which is not to train young people for any particular occupation or profession but to be better citizens and better men?—I do not know that I would separate them.

26514. You are speaking in your note of both?—Yes.

26515. The kind of education of which I shall speak is the latter kind; that is, training people to be better men. Now you say in your note that you think the teaching of agriculturists should be associated with labour and field interests in order to turn out better agriculturists?—No, I am afraid I do not say that definitely.

26516. Yes, you have said that?—No, I merely say that it might cancel the handicap under which they would labour owing to their long absence from the fields. It is not that I deny it. I simply do not know enough to say so positively.

26517. You say, "No more could be done than to associate instruction with labour and with field interests in such a degree as to prevent pupils on their return to the fields from being handicapped by their schooling." That is what you have said?—Yes.

26518. Do you think agricultural education cannot be imparted in primary schools because the pupils are too young for such education?—Yes.

26519. And you say that is so in middle English schools because the number attending such schools is insignificant compared with the number of the agricultural population. Are you prepared to try the experiment of half-time schools so arranged that the pupils would spend a reasonable part of their time helping their parents in their work and should not lose the habit of working; I mean half-time schools which will fit in with your suggestion?—Certainly, yes.

26520. You say it can be tried?—Decidedly, yes. There is nothing in the way of its being tried now wherever people have the liking; the matter rests entirely in the hands of the Local Boards.

26521. Do you know that some Local Boards have been trying this experiment?—Where?

26522. In the Surma Valley?—There has been an experiment in Habiganj, I think.

26523. Yes. Do you know also that some Local Boards have been trying the experiment of night schools?—Yes.

26524. Do you know that the Social Service League has started some night schools which are attended by many men between the ages of 16 and 40?—Yes, mostly sweepers and people of the depressed classes I think, are not they?

26525. They are all cultivators, not sweepers, generally Mahomedans?—I did not know that.

26526. Have you received an application from the Secretary to the Social Service League asking for your help?—Yes.

26527. You have got a report about the working of these schools?—Yes, I have had some papers reach me fairly lately; I am afraid I cannot give you details about them.

26528. Are you in favour of encouraging these schools?—Decidedly.

26529. You perhaps know that many adults attend the Mahomedan *maktab* schools mainly to be taught the Koran?—Yes; but the vast majority of the pupils reading in the Koran classes of a *maktab* are of course children, boys and girls.

26530. There are also adults?—There are, but not many I should say.

26531. Mr. Calvert: Do you classify that as education?—Yes.

26532. Do they read the Koran or just learn the sound of the words?—They learn the Arabic alphabet, they learn their *namaz*, they learn to read from the Koran but not to translate.

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26533. They cannot translate?—No.

26534. They just learn the sounds?—Yes. That of course is a mere adjunct to the ordinary primary education.

26535. *Rai Bahadur R. M. Das*: Do you think that some sort of agricultural education can be introduced in such schools?—No, none at all I think, nothing that one could call agricultural education.

26536. Do you think selected teachers in some of the primary schools can be trained in agriculture and appointed as teachers of the night schools I am speaking of on extra remuneration?—Well, there is nothing theoretically against it, but I do not quite know how it could be done. The men themselves for the most part have not got a good general education; they are generally very poorly qualified in letters and they have ordinarily, by reason of their occupation as schoolmasters, been divorced from the life of the fields for a considerable time, so that I should not think that any experiment on those lines would be hopeful.

26537. Could you pick out some teachers in primary schools who could be given sufficient training in agriculture to be teachers at the night schools where agriculture is one of the subjects to be taught?—Well, firstly, I do not think agriculture ought to be one of the subjects to be taught in the night schools, and, secondly, I think it would in practice be extraordinarily difficult to make much use of the ordinary primary school teacher to teach agriculturists their own business; I do not think he could do it.

26538. What curriculum would you suggest for the night schools?—Reading, writing and arithmetic.

26538-a. General education?—Yes.

26539. Nothing of hygiene and rural economics?—I am so impressed with the difficulties of dealing effectively with the problem in its simplest form that I would rather not personally undertake anything more ambitious to begin with.

26540. If the agriculturists attend night schools they will certainly get better education, which will make them better men, and at the same time it will not create in them an aversion to manual labour?—No.

26541. You are in favour of such education in night schools?—Yes.

26542. But you would not give any agricultural education?—Not until I saw my way more clearly.

26543. *Mr. Calvert*: By night schools you are thinking of adult education, not necessarily night schools?—Not necessarily night schools.

26544. *Rai Bahadur R. M. Das*: In the half-time adult schools you would not introduce agriculture?—I would take one step at a time.

26545. But you are in favour of half-time adult schools?—Yes, decidedly.

26546. I am sure you have read all about the People's High Schools in Sweden and Denmark?—I have read of those schools in Denmark, not in Sweden.

26547. The People's High Schools are all adult schools?—Yes.

26548. Boys below the age of seventeen are not admitted there?—There are such High Schools, I know.

26549. Do you think that similar classes can with advantage be started in this country?—No. We have got to cover a good deal of ground before we can attempt anything of the kind.

26550. *Prof. Gangulee*: That movement in Denmark rose from the people?—Really speaking from the Church.

26551. *Mr. Calvert*: And it is not vocational?—No.

26552. *Rai Bahadur R. M. Das*: The subjects taught are Swedish, German, Botany, Physics, Chemistry, Political Science and Economics. Each school is generally run by three teachers, one of whom is the headmaster who is responsible for the health and comfort of the pupils, and all the schools are residential?—Yes.

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26553. Are you prepared to support schools started by the co-operative organisation with the object of imparting adult education to its members?—Yes, certainly, if it came forward with any proposal that seemed at all likely to be actually carried through.

26554. *Sir Thomas Middleton*: In answer to a previous question I think you stated that about 14 per cent of the children entering primary schools pass through standard IV and attain literacy?—I do not think I gave the percentage.

26555. Is it approximately correct?—I am afraid I could not give you the percentage. It is a comparatively small percentage.

26556. Of a hundred such boys who attain literacy by passing through standard IV, how many would proceed to a middle school?—Probably about 25; that is a guess.

26557. I only wanted a rough figure. From the middle school, how many of these 25 would go to the high school?—Say about 50 per cent.

26558. Of those who proceed to the high school how many would be expected to finish their course in the high school?—Probably about half of that again.

26559. So, taking the 14 per cent who attain literacy, we can calculate approximately the number who will ultimately matriculate after passing through the various standards?—Might I make a statement? I think there are many more than 14 per cent who actually attain literacy. That is to say, a number of pupils who could probably scarcely be described as fully literate by the time they left school, do possibly develop their knowledge a little after they leave the school.

26560. That means, more than 14 per cent attain and retain literacy?—Yes.

26561. Roughly how many?—I am afraid I could not risk any percentage.

26562. About a fifth?—No.

26563. Somewhere about 14 and 20 per cent?—Yes.

26564. Now, what is the relation between high schools and middle schools in Assam?—The high school embodies two departments, the middle school department and the matriculation department. The middle school is really a middle English school and from that point of view is an incomplete high school.

26565. May I take it that the places provided are places sufficient for the numbers who go forward?—Yes.

26566. Now, 10 lakhs are spent on primary education. How much in the middle schools and high schools?—I am afraid I cannot say offhand.

26567. I find the total expenditure on education 38 lakhs; 9 lakhs for high schools and professional schools; 10 lakhs for primary schools; the balance will be for middle schools. So that, by far the greater part of your educational expenditure is on higher institutions?—Yes; that is so.

26568. I have no doubt that by reading the Administration Reports I will get the cost per pupil in the higher institutions?—The cost per pupil is not stated in the Administration Report or in the Annual Report, but you can get it from the tables in the Quinquennial Review.

26569. On the question of the rates of teachers' pay you have already told us that a primary teacher may expect Rs. 12 to start with, and may rise to Rs. 20?—Yes.

26570. What might the middle school teacher expect to begin at and finish at in the ordinary course?—Say, Rs. 20 and Rs. 45. These are figures given offhand.

26571. I only want some indication. Then the high school teacher?—It depends very largely whether he is a Government school teacher, a Board school teacher or a private school teacher. The Government English Master begins from Rs. 75 and may run up to about Rs. 400.

26572. Is there any opportunity for the best masters in middle schools getting employment in the high schools?—Practically speaking, none.

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26573. So that we have a professional group clearly marked for each of the three grades?—Yes.

26574. You point how impossible it is with the masters you have got in the primary schools and the conditions in the primary schools to do anything in the way of agricultural education. That we can agree to. In the middle school, you say little can be done, but you indicate what might be done. You say, "No more could be done than to associate instruction with labour and with field interests . . ." If we omit labour and if we associate instruction with field interests, you do not think that the result would be sufficient to compensate for the disadvantages. You say, "It would not be an important achievement" ?—Yes, may I say that the association with labour seems to me to be the central thing?

26575. You are thinking of the school farm?—Yes.

26576. At the end of that paragraph you point out that the great object in seeking middle school education is to escape from the despised existence of the cultivator?—Yes.

26577. Do you not think that the middle school might do something to alter that attitude on the part of the guardian and the pupil, and if it were possible to do anything to alter that attitude the achievement would be important?—Yes; the achievement would certainly be important.

26578. But you think the attitude could not be altered by any measures that might be taken in the middle schools?—I can only say that from my knowledge of social and other conditions in the Province, I can myself frame no proposals that would be likely to have that effect.

26579. You point out the difficulties. They are plain enough to all of us. Then, in a guarded way you put forward proposals. You say "The first step must be in colleges . . ." There must be a step before the colleges, you have got to get the staff before you start the college course?—For the college course you want teachers, and they could be found.

26580. I myself was once in the difficult position of having to start one of the first agricultural colleges in India. My initial difficulty was the provision of material for teaching purposes; I had to frame a suitable syllabus and courses of study; it took a considerable time?—Yes; I expect so.

26581. I follow your argument and your reasoning. You say, "The courses would have to abjure the Dream and come down to the Business . . ." I agree with that as regards agriculture. What I ask you is, would you make that statement about general education?—In what way?

26582. "Abjure the Dream and come down to the Business." What is the business of general education?—We defined it fairly lately in an Enquiry Committee, but I confess I have forgotten the precise definition we arrived at.

26583. The business, I take it, is the business of training leaders for the country; that is the main business you have got in view. It is just as true of general education as of agricultural education that you cannot get ahead until you have trained leaders?—Yes.

26584. To what extent are you successful in your effort of training leaders?—That asks for a judgment; does it not?

26585. Shall we agree that training is as difficult in general education as it is in agricultural education, on account of the absence of training in the leaders?—I should think very much more difficult in general education.

26586. On page 147, you have used a metaphor that appeals to me; you say; "The uncertainties of to-day are the certainties of to-morrow. And the money spent on them is well spent in the process of pushing back the margin of educational cultivation . . ." If you drop the metaphor, omit the word 'educational,' and take your phrase in its literal sense, I say that we agriculturists do not push back the margin until we are assured of our market for our products?—Yes.

26587. What are the openings that you have here for your products?—That is a very difficult question. So far as secondary education is concerned, we have not got a market; we are pushing already far beyond what we have any justification for.

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26588. You yourself pointed out very clearly how in agricultural education you must proceed after having first trained the leaders. It seems to me, looking at your whole expenditure on education, that you are incurring relatively a very heavy expenditure on higher education and that you are paying your primary teachers miserable salaries, and I ask myself whether it would not be a better policy to spend less on attempting to find the leaders at this stage and to spend more on securing literacy by a better treatment of your primary teachers?—Yes.

26589. I cannot think that, so long as you offer salaries of Rs. 12 rising to Rs. 20, there is much hope for bettering the village population through the teacher?—Yes. On the other hand, we cannot very well decrease the expenditure on secondary education. The only practicable course politically would be not to increase it, unduly, at the expense of primary education; that would be to allot proportionately more largely for primary education in future.

26590. *The Chairman*: You do not propose to institute an entrance examination between your primary and middle schools and between your middle and higher schools in order to limit the numbers?—We are just introducing an entrance examination or an examination at the close of the middle-school stage, but we have not yet decided that a boy shall not enter the high school unless he has passed that examination; that will probably be the next step.

26591. Is that likely to have the effect of limiting the numbers who go up?—I do not think you can reduce the numbers, but it is simply a question of preventing an unduly rapid increase.

26592. Would public opinion support any proposal to raise the standards of education?—Public opinion would certainly not support it.

26593. *Sir Thomas Middleton*: You used a striking expression in replying to one of the Chairman's questions. I do not remember the expression exactly but the gist of it was that you hoped to get from the people who did not go forward those who for the future will go forward. I asked myself, forward to what?—Here the only answer is forward to literacy.

26594. I understood that it was forward from the standard IV stage?—No, it is forward to literacy.

26595. Would you agree, then, that the important problem here is to secure an advance to the stage of literacy rather than to go forward to the higher stages of education?—I think both are immensely important. We ought to, as far as we can, devote ourselves to the general advance of education, and to an improvement in the extension of higher education.

26596. I am personally impressed with pushing back the margin of cultivation?—That is very important.

26597. But I think of the market and of the reflex effect of a glutted market upon education?—Yes.

26598. *Mr. Hazlett*: In reply to a question by the Chairman, you mentioned the fact that it was quite impossible to introduce any sanitary arrangements in the ordinary primary school; will you kindly give us your reasons for making such a statement?—I am not sure if I quite clearly understood what was meant by sanitary arrangements.

26599. *The Chairman*: I was thinking of the provision of well constructed latrines and so forth, and keeping those facilities in proper and cleanly order?—Apart from the simple fact that we find it impossible to maintain simple school buildings in decent order, the cost of sanitary latrines would be altogether out of the question. We have the more important fact that the latrines require sweepers, and they are not forthcoming.

26600. *Mr. Hazlett*: There are no sweepers in the Province, they are all imported men?—Yes.

26601. We have no sweepers in the village?—No; apart from that, we have not the money to pay for them.

26602. *Sir Henry Lawrence*: Where are they imported from?—Mostly from Bihar. Most of our sweepers, also *goucalas* and so forth come from Bihar.

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26603. *Sir Thomas Middleton* : What do you have to pay them?—Considerably more than the schoolmaster.

26604. *Mr. Hazlett* : On page 146, in reply to Question 23, you hint at the fact that both the parents and guardians and our students are not quite satisfied with the present system of education?—Yes.

26605. The expression you use is "because no sort of salvation is to be found thereby"?—Yes.

26606. Do you think the time is ripe for a radical change in our policy of education?—It is more than ripe from the educational point of view but, whether it is ripe from the political point of view or not, I cannot say.

26607. You do not think, for instance, that our local Council would support Government if they declared that their policy was to convert our present Arts colleges and our present Government high schools into agricultural colleges and agricultural high schools?—No.

26608. That policy would not be supported in the Council?—No.

26609. *Dr. Huxley* : Why do you say that?—Take the science courses; the example of Great Britain, I suppose, many years ago, has led people in India as a whole to pay undue attention, as I have already stated, to physics and chemistry. Of all sciences, these are looked upon as "science" *par excellence*. The other sciences are not regarded as having the same standing or the same utility from the national point of view, but only of some utility as cultural subjects.

26610. You think the members of the Council here would not agree to the proposition that the young men of Assam should acquire a knowledge of botany with regard to tea, rice and such other useful things? Would not they be getting useful knowledge as well as general culture?—We have just obtained affiliation in botany, and I suppose the answer to that question will come when we compare the enrolment for our botany class with the enrolment for our physics and chemistry classes; there has in fact been no effective demand for botany, zoology, geology, or any other science except physics and chemistry up till the present time.

26611. *Mr. Hazlett* : A policy of giving an agricultural bias to all the schools up to the middle school might not meet with public support?—Not probably to the exclusion of the ordinary cultural courses.

26612. I notice that Government pays 75 per cent of the cost of education of a boy in an arts college and 46 per cent of the cost of education in law; does it seem right that Government should spend money educating law students when we have got too many lawyers?—I think it is inadvisable.

26613. Is there any other country in the world that pays 75 per cent for arts students?—There are such countries. May I say with regard to the Law College, that the expenditure on this college is trivial.

26614. The total expenditure is not very high?—Yes, with regard to arts colleges also, if the money spent on them were used for primary education, it would make no noticeable difference.

26615. It would not be of much effect?—No.

26616. Is the class of boy whom you would aim at selecting as a primary school teacher the ordinary cultivator's son who has passed through the primary school, gone through the middle course and then undergone normal training? He would go back to his village and take an interest in his village. Do you think it is a sound policy to try and get that type of man. He would help village life and might do some good to his village?—Certainly.

26617. *Prof. Ganguly* : Have you any proposal for raising the status of the village schoolmaster?—You can raise his status by raising his pay.

26618. Have you any proposal at the present moment before Government to raise his pay?—No.

26619. Does the village schoolmaster belong to the village or does he come from outside?—It depends upon the sub-division. In Kamrup, for example, he will ordinarily belong to the village. In the more backward sub-divisions, we have to import men from outside.

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26620. Have you at any time discussed the question of agricultural education with the Department of Agriculture?—We have discussed it many times.

26621. With what result?—We discussed it mostly in connection with the recommendations of Agricultural Conferences; the result was generally negative.

26622. *Sir Thomas Middleton*: On page 140 of your note you speak about the cultural value of the courses being adversely affected?—Yes.

26623. Are you not thinking of the examination value there?—Not there, not so far as middle-school education is concerned;

26624. You mean cultural value?—Yes; if we were dealing with high-school education, it would be a different matter.

26625. *The Chairman*: Do you attach any importance to manual training in primary schools?—Not much, except where you have five classes under a single teacher who gives the children something to do in order to keep them occupied.

26626. Do you approve of the policy of compulsory primary education?—No.

26627. Is compulsory primary education about to be tried in the Province?—We passed the Act at the last Session of the Council.

26628. That is a permissive Act?—Yes.

26629. Do you expect that many local bodies will undertake the responsibility and the cost?—I think they may with reference to very limited areas if we can find money to support them.

26630. What is your main objection to the principle of compulsion?—The first objection is that the people are too poor. Education costs money and, although probably it would not be beyond the means of an ordinary cultivator even in the poorer areas to send one boy to school, it might hit him very hard if he had to send two or three boys.

26631. It is the loss of the boys' labour?—Simply on account of the cost of clothing, school-books, slates and paper.

26632. Is it proposed under your system of compulsion to finance the principal charges out of local taxation and then, apart from that, to call upon the parent to pay for the books and slates and so on?—He will also have to pay for the clothing which is the most important article.

26633. *Dr. Hyder*: Suppose he does not go to the school and works in the fields, the parent has still got to provide him with clothing?—If he goes to the fields he may ride on a buffalo and wear a loin cloth; if he goes to the school, then he wants a little *dhofi*, a little coat and probably an umbrella.

26634. Your experience is that the boys working in these marshy districts wear better clothes than the boys who look after cattle?—Decidedly.

26635. Does he not want an umbrella when it is raining and he has got to go out to the fields to work?—No.

26636. *The Chairman*: What would primary education cost if you were to have each boy educated at this moment?—It is a little difficult to say. I got out figures some years ago when I was writing the Quinquennial Review and the estimates covering four years ran from Rs. 25 to Rs. 60; that is the total cost.

26637. For what period was that?—For four years.

26638. That would be a gradually ascending expenditure?—Yes.

26639. You say that the population is too poor to bear compulsory education. Do you think that the population of Assam is poorer than that in other parts of India?—I should think it is probably more well-to-do than the population in many other parts of India.

26640. So that, *a fortiori*, you are of opinion that no other part of India is at present capable of bearing the cost of compulsory education; is that your view?—Yes, that is my view.

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26641. *Rai Bahadur R. M. Das*: Do you think that the people of the cultivating class in Sylhet are so very poor that they cannot afford the expense of sending their boys to primary schools for education?—Yes.

26642. *Sir Henry Lawrence*: Would there be any special difficulties in enforcing compulsion if it were introduced here?—I do not think there will be any special difficulties, we will not have any difficulties here which will not be felt elsewhere.

26643. Have you got the staff to enforce it?—You would have to appoint school attendance officers under the Act.

26644. Would you have any trouble with the people if parents were convicted and sentenced?—It is a little difficult to say; in some of the areas probably there would be trouble but those are not the areas in which compulsion would be introduced.

26645. *The Chairman*: Would you like to see the cost that would fall upon the parents under your proposals for compulsory education made a charge upon the public?—No.

26646. Why do you say that?—If the people are not in a position to pay for the materials required by the children for their education, I should say the country is not ready for compulsion.

26647. *Prof. Gangulee*: Your sole objection is on the ground of poverty. Have you any other objection?—The second objection is that the majority of the people at least should be persuaded to realise that education does bring some advantage before we attempt to introduce compulsion.

26648. *The Chairman*: Have you formed any view yourself as to how many years it will take to achieve literacy for, let us say, 50 per cent of the population of India under the present arrangements?—Of India as a whole?

26649. Take Assam if you like?—It will take a great many years, probably half a century.

26650. Do you think that 50 per cent in fifty years might be achieved?—Yes.

26651. *Dr. Hyder*: What is the present proportion of the children of school-going age who are being educated? How many children are there at present in the schools?—About 300,000.

26652. What is the total number of children of school-going age?—Probably about 1,600,000.

26653. And you have got at present about 300,000 children in schools?—The total population is roughly 8,000,000 and if you take 20 per cent of that to be children of school-going age it will give you about 1,600,000.

26654. How many out of these 1,600,000 are at present being instructed?—About 300,000; say, between 250,000 and 300,000.

26655. *The Chairman*: Your figure of 50 per cent in fifty years referred to the total population and not to the school-going population?—I meant literacy in the total population.

(The witness withdrew.)

**Mr. W. L. SCOTT, I.C.S., Director of Land Records,
Assam.**

Replies to the Questionnaire.

QUESTION 8.—**AGRICULTURAL INDEBTEDNESS.**—In this Province, agricultural indebtedness is not so pressing a problem as in Bengal. Generally, the root of indebtedness in India lies in a relatively sudden increase in the value of land held by a populace unaccustomed to the facilities for credit provided by valuable land. Over the whole of the Assam Valley, the value of land has in few areas reached a stage at which it forms a basis of credit; but that stage is now approaching. The proof of this is seen in the relatively low statistics of registration of documents both of transfer and of mortgage. The main causes of borrowing are social requirements and mortality.

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among plough cattle. Borrowing to buy food is not so common as in jute-growing areas. In the Surma Valley, the land mortgage is far more common and the moneylender as such does exist in fair numbers. In the Assam Valley, the usual source of credit is the Marwari shopkeeper whose interest is mainly in trade. He favours as security a lien on the crop rather than a mortgage on the land. Government has endeavoured to check any tendency for land to pass into the hands of moneylenders by inserting in all agricultural settlements made since 1919 a clause forbidding transfer to non-agriculturalists without the permission of the Deputy Commissioner. This condition of course at present applies to a very small proportion of the settled land and its ultimate effect cannot be foreseen. It has, however, operated to check transfers and also to restrict credit. Should the effect of this restriction prove favourable over a period of years it might be advisable to legislate to apply a similar restriction in the case of cultivators who cannot be protected by the terms of their lease.

QUESTION 15.—VETERINARY.—I have one suggestion to make, arising out of Question b (ii) under 15. It is impossible, it appears to me, to throw upon Government the onus of providing veterinary help in all cases in which it is required. The remedy appears to me to be in encouraging the growth of independent veterinary practitioners and something might be done to assist such practitioners in certain areas. Instead of appointing Veterinary Assistants in all places, I should recommend the starting of a certain number of qualified practitioners with a lump sum grant sufficient to cover the initial cost of instruments and a modest dispensary building, and a diminishing stipend sufficient to maintain a practitioner in moderate comfort at first, and diminishing to nothing at the end of, say, five years, by which time it might be hoped he would have gained a sufficient local practice to carry him on.

Oral Evidence.

26656. *The Chairman* : Mr. Scott, you are Director of Land Records in this Province?—Yes.

26657. Do you wish to make any statement of a general character?—No. In answer to questions in the Questionnaire I have given information on all the points which I thought could be useful.

26658. We are obliged to you for this note. You present us with a picture which is similar to that in other parts of India. Is it your view that in framing a policy designed to relieve in some degree, at any rate, the burden of indebtedness on the agricultural population, it would be of real assistance to have before you an accurate survey of the state of debt?—It would be useful, but I do not think it would be sufficiently useful to make it worth while to incur a great amount of expenditure on the matter.

26659. Is anything known about the proportion of secured to unsecured debt?—You mean the proportion of mortgaged debt to the other debt?

26660. Yes?—I do not think we have any figures; they would differ very greatly between the different parts of the Province, say, between the Surma Valley and the Assam Valley.

26661. Is the principle of non-terminable mortgage common in this Province?—I think so; I have not examined the matter in detail.

26662. Do you not think that those are facts which might very well be ascertained and correlated before any policy was decided upon?—It would be useful to know the terms of the mortgages.

26663. Have you anything which you would care to say about the law, whether All-India Statutes or Provincial Statutes, dealing with questions of debt?—No. My impression is that statutes dealing with usury have usually been a failure. I have been told by one of my Settlement Officers that the Usurious Loans Act, recently passed, has been circumvented in various ways.

26664. *Mr. Calvert* : Such as?—Addition to the capital is the obvious one, and the one most generally used.

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26665. How can that circumvent the Act?—It is put in, and there is no way for the borrower to prove he did not have that amount.

26666. The court itself can frame the issue?—Yes, but the court will require evidence to hold that the amount is wrongly given.

26667. The court can itself make an inquiry into the whole transaction. How does that prevent the court from holding an inquiry?—The only evidence before the court will be the entry in the moneylender's book and the entry in the document.

26668. The entry in the moneylender's book need not be taken as accurate?—There is no other evidence.

26669. There is the evidence of the actual borrower?—I should not say that was worth much more than the evidence in the books.

26670. The Chairman: Have you ever considered the advisability of a system of registering and licensing moneylenders?—No.

26671. Have you interested yourself in the question of excessive fragmentation as a result of sub-division?—Yes. I have come across it as a Settlement Officer, and I have tried to get evidence of the progress or otherwise of fragmentation within the last twenty years.

26672. Do you think it is progressively increasing in this Province?—I think it must be, because the worst villages I have seen from the point of view of fragmentation, have been the oldest-settled villages in the Surma Valley. The matter has not proceeded so far in the Assam Valley, which has been opened up much more recently.

26673. Do you connect excessive fragmentation with debt?—No.

26674. You do not think it is a cause of debt?—I do not think so.

26675. You have large areas of cultivable land still unsettled in this Province?—In the Brahmaputra Valley.

26676. Have you noticed any tendency on the part of cultivators living in those villages, where excessive fragmentation has taken place to move from those districts and take up land elsewhere?—It is in the thickly-settled villages that you find the worst fragmentation.

26677. Do cultivators move from such areas to tracts where there are virgin lands still to be had?—There is a great deal of movement now from Bengal to the Brahmaputra Valley, and there has been a certain amount of transfer from Sylhet and Silchar in the Surma Valley to parts of the Brahmaputra Valley, but it has not been excessive.

26678. People do not like to leave their homes?—Quite.

26679. And probably the type of cultivation on the new land is not one to which they are accustomed, would that be so?—Yes, at any rate in the case of the lands now open to cultivation. It was different forty years ago, when people from Sylhet had only to cross to Silchar to find land available for cultivation. Now they have to transfer themselves to the Brahmaputra Valley, where the work is different.

26680. Are any exact statistics in existence dealing with the facts of fragmentation in this Province?—No. I have tried to get some. We are just doing a course of resettlements in the Assam Valley. Unfortunately we have introduced a new definition of the word "field" and that has entirely obscured the actual facts of fragmentation.

26681. Do you mean it has invalidated the two series of figures for purposes of comparison?—It has invalidated them for the purpose of considering whether there is more fragmentation now than there was twenty years ago.

26682. How does it come about that you have interested yourself in the veterinary problem?—Three or four years ago I was for six months Director of Agriculture. At that time the Veterinary Department was under the Director of Agriculture, and this was one of the ideas that struck me at that time.

26683. Do you think there would be any prospects, either in this Province or anywhere else in India, for what you call independent veterinary practitioners?—I think it is an experiment that should be tried before the people become entirely pauperised by the idea that they are entitled to free veterinary help from Government.

26684. The risks of the experiment would of course fall on the young practitioners who turned their backs on Government Service for the time

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and went into the districts and tried to build up a practice. How would you encourage them to take those risks?—I propose to start them off with living wage.

26685. You propose a diminishing stipend for them, commencing with a living wage?—Yes, beginning with what a veterinary man now gets from Government.

26686. *Sir Thomas Middleton*: According to the survey, you have in Assam about 41,000,000 acres. I assume that is the figure got from the topographical survey. To what extent have you got figures from the cadastral survey in Assam? What area of Assam has been surveyed?—I cannot give you the figures off-hand.

26687. I only want a very rough idea. Would there be 5 or 10 million acres surveyed and settled? The area cultivated is about 5 millions?—You will have to exclude the whole district of Sylhet, which has not been cadastrally surveyed, and most of Goalpara.

26688. Is the cadastral survey not proceeding under your direction?—No. There is a separate Survey Department which does the technical work of producing traverse outlines of all the villages.

26689. You fill up the village maps?—Yes.

26690. *Sir James MacKenna*: Is that the Survey of India?—No, the local Assam Traverse Party. As a matter of fact, the Director of the Eastern Circle of the Survey of India gets an allowance from the local Government for supervising the work, but the work is actually done by a staff paid by the local Government.

26691. You are in charge of Settlement as well as Land Records?—Yes.

26692. What is your theoretical basis of assessment here?—I have to confess we have none.

26693. No fixed proportion of gross assets?—No. We do not estimate net assets. The only rule that has been laid down is that an assessment should never exceed 20 per cent of gross assets, or one-fifth.

26694. You do not even work to one-fifth?—No, nowhere near.

26695. You are hard up in Assam, are you not?—I am not Finance Member.

26696. *Mr. Hazlett*: 11 per cent is our maximum, I think?—I am just sending up a group report to-day in which the proportion of gross assets proposed is 11·3 per cent.

26697. *Sir James MacKenna*: In Burma we take up to 50 per cent but that is on the net assets, of course. In the revision of settlements, do you give any preferential treatment in the case of improvements which have been paid for by the cultivators themselves?—Under the rules, they are exempted from enhancement for one resettlement period for improvements effected at the expense of the landowner.

26698. The period of settlement being twenty years?—It was twenty, but is now being made thirty.

26699. Are any grazing grounds reserved by Government?—In all the districts in which waste land has been available, every effort has been made to reserve large numbers of grazing grounds, available for all the people.

26700. Are they scrub jungle or grazing grounds in the strict sense of the word?—I have seen somewhere there was good grazing; on the other hand, some are full of tree jungle and reeds. They vary.

26701. Have you any provision in your land revenue rules for a systematic tillage of bad grazing ground with a view to bringing it to a state of cultivation?—No. Grazing grounds are more or less a new experiment in this Province; they were only started twenty years ago.

26702. From our experience in Burma, I should say that is a thing to leave alone. In a settlement, do you make any provision for cases where a cultivator sets aside a portion of his holding for grazing beyond the ordinary fallow remission?—In the Surma Valley, it would be classed as waste if it had not been cultivated for three years, but at the most it would have to pay one-fifth of average rice land.

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26703. But that is preferential treatment?—Yes. That would be where we found a case of a man who had reserved land for grazing for at least three years.

26704. Have you a provision to that effect?—No.

26705. But the ordinary Settlement Officer would give it?—I think so, yes.

26706. And in regard to classifying land used for grazing as waste, the right of the landholder would be reserved; he would not lose his lien on the land. It would still be inside his holding?—It would still be his land.

26707. *Prof. Gangulee*: What is your actual basis of resettlement? Can you give me the broad outlines of it?—The rule is that three years before the district falls in a report is expected from the local officers, who have to state in the first place whether from a technical point of view a resettlement is called for in order to bring the records up to date, and also whether, considering any changes which may have occurred in the district within the last resettlement period, an increase in revenue can fairly be expected, and if so, to what extent; also, whether conditions have deteriorated to any extent so as to call for a reduction or a resettlement with no enhancement but merely readjustment.

26708. For how many districts have you resettlement reports now?—Five in the Assam Valley and one in the Surma Valley practically complete, and parts of two others in each Valley. Then there are temporary settled portions in Sylhet, Goalpara and the Garo Hills; and the whole of the districts of Cachar, Lakhimpur, and a few others are temporarily settled, except for tea garden grants, large grants.

26709. What is the value of land per acre now, say, for instance, in the Assam Valley?—Anything up to Rs. 450 an acre, but I have only come across one small area in which the value is Rs. 450.

26710. And in the Surma Valley?—Unless the land is under water, you will never find the rate below Rs. 50 an acre; on the average it is round about Rs. 200 to 300 an acre; but the average in the Assam Valley would be very much lower, for there are large areas there in which the price of the cultivated land is merely the cost of clearing the land.

26711. *Sir Henry Lawrence*: Is it land on which money is being spent on improvement?—There is no improvement except the cutting down of grass or jungle growing on it and the cost will be about Rs. 5 a bigha.

26712. *Prof. Gangulee*: What will be the value of the land already put under cultivation?—That will be anything above the cost of clearing.

26713. Has the value increased during the last ten years?—It has increased enormously during the last twenty years.

26714. What would you say is the percentage of increase?—300 per cent; that is what has been stated, in Sibsagar, to be the rise in the value of the land since the last resettlement; the land is now worth four times what it was.

26715. *The Chairman*: It is not a question of village land or village site?—There are no village sites in this Province; the houses in villages in the plains in this Province are practically scattered round among orchards. There is hardly any question of site value in the villages.

26716. *Sir Henry Lawrence*: What provision is there to prevent improvements made by the tenant or landlord from being assessed to taxation?—It is provided in the rules that if Government allows the landholder to be let off he has got to pass it on to the tenant; but I have never come across any case of the sort you suggest.

26717. But is it possible any increase of taxation could be levied in regard to improvements made by the landholder?—Yes, at the end of the next settlement.

26718. Improvements are liable to taxation?—Yes, at the end of one settlement period.

26719. Is there provision in the *Settlement Manual* to prevent that?—No; it is laid down in the instructions that improvements are free of enhancement for one settlement period. The actual wording is: "The Settlement Officer will not ordinarily enhance the land revenue of an estate or group of estates on the ground of drainage works, irrigation works or similar improvements which have been carried out at the expense of the settlement

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holder or settlement holders during the currency of the expiring settlement." That means that they are liable at the following resettlement, but not the current one.

26720. *The Chairman*: Supposing if it were made within a year of the new settlement, would that be liable to be assessed at the end of the year?—No; he would have it free for the settlement period, twenty years or thirty years as the case may be.

26721. *Mr. Culvert*: In your note you suggest, I think, that the rise in the value of land has proved a temptation to the ryots to borrow?—Yes.

26722. Have you enquired as to whether the mortgage value per acre is rising along with the rise in the value of the land?—No; I have not; not at any rate in the district of which I spoke when I said that the value of the land was rising enormously.

26723. You have not got any figures to show that the mortgage rate per acre is increasing?—No; they could be got, I think, from the Registration Office; but, in the Assam Valley, the registration of documents is very uncommon and you get very few registered documents indeed.

26724. Is it your experience that the number of moneylenders is increasing?—My experience in any one district is not long enough to say that, not within the time I was there.

26725. Have you looked into the question whether the total money lent is increasing?—No; on the basis of the increase in the value of the land I should think that the total amount of money lent must be increasing; but I have not looked into the question, I have not verified it.

26726. You refer, I think, to the tendency of restrictions on the right of alienation to restrict credit?—Yes.

26727. Have you found that such a restriction also involves any rise in the rate of interest?—I assume that it would, but I have not verified it.

Everybody assumes that it would; but we never got any fact in proof of the assumption.

26728. On this question of the Usurious Loans Act, is the opinion you express regarding the ways of getting round the Act based on experience of superior Appellate Courts or just an ordinary casual opinion?—It is merely a casual opinion. I do not know of any striking case that has been before the superior Appellate Court.

26729. Have you read Mr. Darling's book on the "Punjab Peasant"?—Yes.

26730. Speaking very roughly, would you think a similar enquiry in Assam would yield results somewhat similar?—Except in the volume of debt, yes.

26731. The volume of debt varies with the amount of credit?—Yes; I think that is the case. But the actual figures of indebtedness in Mr. Darling's book astounded me. I do not think that in this Province you will find anything like the same volume of debt expressed in rupees.

26732. Of course you have not got the same volume of prosperity?—No.

26733. If your lands are worth Rs. 200 an acre, you cannot have the same amount of debt as in the case of lands worth Rs. 1,000 an acre?—No.

26734. Otherwise you would expect to find in Assam the same general trend?—Yes.

26735. Debt does depend on the psychology of the cultivator?—You find of course far less debt in rice-growing country than in jute-growing country; that is why I said that indebtedness was not a very serious problem here as it is in other parts. My previous experience was in Eastern Bengal, in a jute-growing district, where the indebtedness was appalling; I mean part of Mymensingh. It was the indebtedness that led to the riots in 1907 and to the special measures taken by Government to establish co-operative credit societies to meet the situation.

26736. Taking Cachar which you know very well, would you say that the volume of debt varies with the mentality of the cultivator?—I think they are all very much alike; they mostly borrow as far as they can, as far as the moneylender accommodates them. The Cacharis are always in debt.

26737. Do you think a similar study for Assam would prove to be of educational value, as a basis for any policy?—It would be very interesting

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26738. You do not think it necessary to concentrate attention on this problem?—It might yield useful results; that is what I can say; I have not gone into the question deeper.

26739. Could you give us any idea of debt in terms of land revenue?—No; I cannot.

26740. Taking Cachar again, have you investigated the extent of fragmentation, that is, the number of plots per ryot?—We could give you the number of plots per estate.

26741. It would not be quite the same thing though?—No; the estates are very often held in common.

26742. You have not worked out the number of separate plots per ryot at all?—That is a very difficult thing to do, because we have no figures showing the number of ryots. I can tell you the number of estates; but three estates or six estates may be made up with permutations and combinations by three brothers, let us say; A will have separate land, B will have separate land and C will have quite separate land; again A and C may have one plot, A and B another plot and so on; this is only a simple case.

26743. You have no figures showing the area of land held on *patta* by ryots?—Not per ryot; no.

26744. I gather from this Report on Cachar that there is comparatively little tendency towards what is called sub-letting; does it apply to the whole of Assam?—Yes.

26745. So practically very little of land in Assam is cultivated on terms which deter the cultivator from improving the land?—Yes.

26746. *Sir Henry Lawrence*: On the question of assessment, I suppose you have a settlement once in thirty years?—Up till now it has been twenty years; but the new system which is to come into force from 1st April next would make it thirty years.

26747. Now suppose you have a settlement which is going to expire in 1940 and a man spends Rs. 10,000 on drainage to-day, when would that improvement resulting in his land be liable to an increase of assessment?—If it is a district in which the current settlement expires in 1940, the assessment will not be enhanced in 1940, but it would be enhanced in 1960 or 1970 according to whether the next period of settlement was to be twenty or thirty years.

26748. And after that, how would you levy your increase?—We should assess according to the classification of the land as we found it. Of course the problem is not a difficult one in this Province because there is very little irrigation—practically no irrigation. The improvement that we mostly have to deal with is the making of new homesteads which often involves a great deal of work, raising of the land, planting of trees and so on; that is the improvement that we have generally to deal with. It is in the northern part of Kamrup and Darrang districts where we have much irrigation, and that is not done at any large expense to the landlord; it is simply done by the united labour of a village. We have very few cases of actual expenditure of money on improvements; just one or two.

26749. On what principle would you assess the increase?—It would be valued; the land which had been improved would be assigned to a class which would have a comparative value assigned to it as compared with other kinds of land.

26750. *Sir James MacKenna*: In other words, it would come into the ordinary settlement?—Yes, it would come under the ordinary settlement after the expiry of a complete settlement period.

26751. *Sir Henry Lawrence*: "Ordinary settlement" is a term which has no application to a great part of India; it varies in different Provinces. Does the fact that the land will be liable to assessment after the expiry of the settlement in fact discourage landlords or tenants from carrying out improvements on the land?—I do not think so; I do not think that it is ever considered.

26752. It has been alleged in some papers presented to us that it does discourage the investment of capital in land?—It is hard to prove a negative, but I do not think it has done so.

26753. *Dr. Hyder*: Would you class the bringing of waste under the plough as an improvement effected by a cultivator?—Not if it merely involves breaking up the soil or cutting down a certain amount of jungle.

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26754. That is to say, it would not be an improvement effected by the cultivator?—No, I should call that cultivation,¹ not improvement.

26755. Suppose the cultivator has got land on which he has been paying a very low rate of revenue in a district that was settled some years ago, when you make a resettlement, would you increase the rates considerably or not?—If the land remains the same or the land has been brought under cultivation?

26756. Suppose it was previously waste paying a very low rate; now it is under the plough; you say bringing the land under the plough is not improvement?—Not unless it has to be made fit for the plough, either by drainage or by irrigation. If the man has spent money in draining a marsh in order to make it cultivable, or if he has spent money in bringing water to high land otherwise uncultivable, then he has effected an improvement and we should leave him at the low rate for the next settlement period. On the other hand, if all he has done is to run his plough over land which by the grace of God has now emerged from the water and is cultivable, then we should charge him the full rate applicable to that class of land.

26757. It is referred to at paragraph 74, page 23 of your Settlement Report?—Yes.

26758. The increases are considerable, but according to this new basis which you adopted in resettling waste, of course, the effect becomes small. My only point is this that where the cultivator begins to clear the jungle from land which is in private ownership, he will have to pay at the next resettlement the higher rate applicable to the class of land; is not that so?—Yes.

26759. Apart from these two things, drainage and irrigation, which you say people do not require in this Province, the only improvement that can take place on any piece of land in Assam is the clearance of jungle?—And the making of a homestead, which is practically the only improvement which I had to deal with in the case of Cachar; there we allowed the concession by reducing the class of the *bari*; a very low rate was charged on what we call second class *bari*; we only charged that, however good the *bari* was, provided it was new.

26760. *Rai Bahadur R. M. Das*: You say in your note, "The root of indebtedness in India lies in a relatively sudden increase in the value of land held by a populace unaccustomed to the facilities for credit provided by valuable land." In the Surma Valley, do you not think that the deterioration of the productivity of the soil by intensive cultivation equally accounts for the indebtedness of the ryots?—No, I do not believe in that deterioration of the soil; I do not think such deterioration has occurred as would justify any argument that it would lead to heavy indebtedness.

26761. *Mr. Calvert*: The soil does not deteriorate by cultivation?—Rice land does not in the land that you get in the Surma Valley. I do not mean virgin soil, virgin soil will give you bumper crops for twenty years, and then it is reduced to the ordinary level of fertility below which it is not likely to fall unless you introduce a new method of cultivation or different crops.

26762. *Rai Bahadur R. M. Das*: But the greater portion of the soil in the Surma Valley is not virgin soil?—No.

26763. So that you mean to say that although it is not virgin soil and has been cultivated for centuries, there has been no deterioration of the productivity of the soil?—Not within a hundred years; it is already at its minimum, it cannot go further.

26764. You know that the greater portion of the Surma Valley has been cultivated for the last 400 years?—Yes.

26765. In spite of the intensive cultivation during the last 400 years, you mean to say there has been no deterioration of the productivity of the soil?—Not within the last century; I say it reached its minimum perhaps 300 years ago, since when it has gone on producing the same crops year after year and will do so for the next thousand years.

26766. I can tell you that in the last twenty or twenty-five years there has been a great deterioration?—I should like to know on what figures that is based.

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It is what I have seen; in the last twenty-five or thirty years there has been a deterioration in the productivity of the soil; I have seen it in my village, there has been a noticeable deterioration in the productivity of the soil in the last thirty years. I can speak from at least forty years' experience in my village, but you say there has been no deterioration.

26767. In the Assam Valley, the settlement operation is in progress now?—Yes.

26768. Has each cultivator in Assam proper got sufficient agricultural pasture land for grazing purposes?—No, most of them have none; they do not keep any; there are no private grazing grounds.

26769. You say no?—No, they have none.

26770. Would you suggest to the Government that during the present settlement operations each cultivator should be assigned such land at a low rate of rent or revenue, as they call it? On condition that he kept it as grazing ground?—Yes, on condition that he kept it as grazing ground.

26771. The Chairman: Would you include land used for growing fodder in that question?

Rai Bahadur R. M. Das: Yes.

26772. On condition he kept it as grazing land or for growing fodder crops?—Until the people have learned to grow fodder crops it is impossible, because they will not keep the land for grazing.

26773. It could be settled at a low rate of revenue on condition that he uses it for grazing purpose?—The condition would be impossible to preserve; you would have to have a *thana* in every village to enforce it.

26774. Your *mauzadar* or *gaonhura*, or whatever you call him, would do that?—The *gaonhura* is nobody; he has got no authority in the village as a rule. The *mauzadar* is usually satisfied if he gets his revenue. You would have to have a *thana* in every village to enforce the rule. And where are you to get the land from to begin with? Over a great part of Assam, the land is very nearly as thickly settled as in the Surma Valley.

26774-a. Where possible, I say. Will you not assign some common pasture land to the villagers in certain villages?—Yes, common ground, much against my better judgment, we are assigning. Wherever land is available, land is reserved for pasture.

26775. Is it fenced?—No.

26776. How do you enforce this reservation of land for the purpose of pasture?—I will say we endeavour to enforce it. When I am on tour I often inspect pasture land to see whether the *mandal*, the *patwari* as he is called in other parts of India, is doing his duty in resisting encroachments on the pasture land, and very often I find that encroachments take place and are not reported. It is one of the most difficult things to insist upon, because generally the man who makes the encroachment is the man with the most influence in the village.

26777. It would go a great way towards the solution of the question of pasture land if you could enforce this in the case of each cultivator?—You cannot even enforce it in the case of large commons for a group of villages; it seems to me to be a hopeless task to try and enforce it for each holding.

(The witness withdrew.)

Major T. D. MURISON, D.P.H., I.M.S., Director of
Public Health, Assam.

Memorandum on Rural Sanitation.*

The Director of Public Health is the administrative head of the Public Health Department and there is an Assistant Administration. Director of Public Health to help him. The Civil Surgeons of districts are the Health Officers of their respective districts.

There is a Health Board (Epidemics) consisting of the Inspector General of Civil Hospitals and the Director of Public Health, Assam, which coordinates the activities of the Public Health and Medical Departments.

* Reprinted from the preliminary memorandum prepared for the Commission by the Assam Government.

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All important public health projects affecting the Province are considered and reported on by the Provincial Public Health Board on which a non-official member is also represented.

Registration of vital statistics in rural areas is not compulsory. In the Cachar and Sylhet districts and in the permanently-settled areas of the Goalpara district, registration is done by Police agency. Village

Vital statistics. *chowkidars* enter the village births and deaths in *hathchilas* (village registers). The *hathchilas* are brought by them to the police stations or outposts. The entries in the *hathchilas* are copied into the police station registers and a monthly return is made to the District Civil Surgeon. In Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur and in the *khas mahal* areas of Goalpara, registration is done by revenue personnel. *Gaonburas* (village headmen) of villages keep the *hathchilas*. The *hathchilas* are submitted to *mauzadars* (revenue collectors appointed for *mauzas* or groups of villages) and copied into their registers. The *mauzadar* compiles a monthly return from the reports of the *gaonburas* and submits it to the District Civil Surgeon.

In tea estates, vital statistics are collected by garden authorities.

In the hill districts, registration is carried out only in certain parts.

Vital statistics for the Province are compiled in the office of the Director of Public Health.

All public health work in the Province is based on these statistics.

To protect the rural population against small-pox, a staff of permanent public vaccinators, sufficient to visit every village in each vaccination season, which lasts from October to March, is employed by each

Small-pox. Local Board. There is a provincial cadre of one Inspector for each district and one Sub-Inspector for each subdivision for supervising the work of vaccinators under the general supervision of the District Civil Surgeon. Vaccination operations are performed free of all charges with glycerinated vaccine lymph manufactured at the Provincial Vaccine Depot at Shillong. Vaccination is not compulsory in rural areas. Temporary regulations making vaccination compulsory are extended to villages in which there is opposition to vaccination and small-pox is prevalent. As a result of large numbers of vaccinations being performed annually, the mortality from small-pox is very low.

When a cholera epidemic breaks out in a village, *chowkidars* in the Surma Valley and Goalpara and *gaonburas* in other Assam Valley districts are held responsible for reporting the outbreaks immediately by wire to the District Civil Surgeon through the District Magistrate. There are at present two mobile epidemic units, one in each Valley, consisting of three Sub-Assistant Surgeons and six disinfectant carriers who have been specially trained in cholera duty. The Director of Public Health arranges to send at once a complete unit or section of it to the affected area according to necessity. The duty of the units is to disinfect all water-supplies, inoculate all contacts with cholera vaccine and treat medically all patients. When an epidemic is severe and widespread, the Assistant Director of Public Health supervises the work of the units.

Cholera. In order to afford relief to persons suffering from malaria, tubes each containing twenty four-grain tablets of sulphate of quinine, sufficient for the treatment of an attack of the disease, are sold to the public through the agencies of post offices and special agents such as vaccinators and *mauzadars* for six annas per tube. A printed copy of simple instructions for use of the contents and also for the personal prophylaxis of malaria is enclosed with each treatment to enable the patient to treat himself without the aid of a medical man. Quinine is also supplied free of charge from all charitable dispensaries.

Malaria. In certain small areas, anti-malaria measures such as clearance of jungle, oiling of water channels and the like are being undertaken.

For *kala-azar* there is a very complete organisation throughout the Province under which treatment arrangements exist in all areas in which there is infection. Special *kala-azar* dispensaries under the control of the Public Health Department have been opened where there is no

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Medical Department or Local Board dispensary in the neighbourhood. Indoor treatment is also provided in all districts and subdivisional headquarters for free treatment of those who cannot attend outdoor dispensaries on account of their physical weakness and also where there are scattered cases which a dispensary centre could not serve effectively. Outdoor cases are treated with plain antimony, a full course lasting about three months. All cases in indoor hospitals and 10 per cent of outdoor cases attending hospitals, are treated with organic compounds of antimony. The latter drug has reduced the course of treatment from three months to about one month. The shorter course of treatment is being gradually extended to outdoor cases. In addition to the staff of existing Government and Local Board dispensaries treating *kala-azar* patients, 6 Assistant Surgeons and 110 Sub-Assistant Surgeons are employed by the Public Health Department for treatment and survey work. All Sub-Assistant Surgeons, whether in charge of special *kala-azar* dispensaries or State or Local Board dispensaries, visit and revisit villages within a certain radius of their respective dispensaries in search of fresh cases, and whenever they meet with a case, it is immediately brought under treatment. Regulations have been framed under the Epidemic Diseases Act (III of 1897) to compel patients to undergo a complete course of treatment, but these are rarely applied as the general policy is to persuade patients to undergo treatment voluntarily by explaining to them the benefits of treatment rather than by the infliction of the punishment for non-compliance with the regulations.

Epidemics occurring in tea gardens are controlled by garden authorities.

Booklets and pamphlets on *kala-azar*, cholera, small-pox and malaria,

popularly illustrated and written in a conversational style showing how these diseases spread and what precautions should be taken to escape infection, are read in village schools. Magic lantern demonstrations on the above subjects are also given by the Assistant Surgeons on *kala-azar* duty when they visit villages in course of inspections of *kala-azar* institutions.

Local Boards, of which there is one for each plains sub-division in the Province, provide villages within their jurisdiction with water-supplies by constructing public tanks or wells in suitable places. When funds are available, the local Government also make grants to Local Boards for the improvement of rural water-supplies, e.g., special grants of Rs. 3,00,000 have been made to Local Boards in 1925-26 and also in the current year. Such tanks and wells are usually fenced and provided with some sort of water-lift. There are prescribed type plans for tanks, wells, water-lifts and fencing but Local Boards have been given discretion to follow or dispense with them. Many families have in addition private tanks and wells which supply water for bathing, washing of utensils, cleansing of houses and so forth. Villages situated on the banks of rivers and streams usually draw their water-supplies from those sources.

Local Boards are responsible for the sanitation of villages under their jurisdiction. In some cases of groups of villages under the Local Board are combined into "Village Authorities." These are responsible for the sanitation of the areas under their charge and also provide water-supplies and maintain village roads. Conservancy and drainage arrangements are however very primitive or non-existent in rural areas.

Under the Public Health Department there is a Public Health Laboratory in which water-supplies and other articles of food and drink are analysed. A peripatetic sample taker is attached to the Laboratory; his duty is to collect samples of articles of food and drink from Municipalities and railway and steamer stations for analysis.

Provisions exist in the Local Self-Government and Municipal Acts for control of the sale of unsound articles of food and drink and, when necessary, the sellers are prosecuted by competent authority and such articles are immediately destroyed.

In spite of the provisions detailed above, the rural water-supply and arrangements for village sanitation are still in most areas defective and very primitive; and their future improvement must depend mainly on two factors—the provision of more funds and the spread of education.

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Oral Evidence.

26778. *The Chairman* : Major Murison, you are Director of Public Health in the Province of Assam?—Yes.

26779. You have provided the Commission with no written note of evidence. I understand you wish to be examined on the note under the head "Rural Sanitation" in the series of memoranda prepared for the Commission some months ago?—Yes. I wrote that note.

26780. And it has been before the Commission for some time, and we have of course had the opportunity of reading it. Do you wish to make a statement of a general character?—No.

26781. Would you just tell the Commission what your service throughout the Province consists of, what officers work under you?—There is myself who direct the operation of the Public Health Department, and I have an Assistant Director who at the present time is stationed in the Surma Valley. His duties are very largely in connection with *kala-azar*; he has to inspect a large number of *kala-azar* centres and sub-centres; he has to inspect Local Board dispensaries, which are carrying out *kala-azar* work; in addition to these, he inspects Municipalities and small towns on their ordinary sanitation work twice a year and reports on their condition; and also whenever there is a big epidemic of cholera, he supervises the operations against the disease; he collaborates with the Civil Surgeon in connection with the epidemic and organises a campaign against the disease and asks for any additional help he may require, which is given to him. These are really his principal duties. Then, in the plains districts, we have a *kala-azar* Assistant Surgeon who works directly under the Civil Surgeon of the district, and he does all the *kala-azar* work in connection with that district. At the time of an epidemic, that is to say, when we have cholera or small-pox, he is deputed to assist the Civil Surgeon in combating that outbreak. Then in each district, we have a Vaccination Inspector, and one Sub-Inspector of Vaccination for each sub-division if the district is divided into sub-divisions. Their duties are in connection with seeing the state of vaccination of the children and the adults in the villages.

26782. What grade are they?—They are styled "Inspectors of Vaccination" and "Sub-Inspectors of Vaccination".

26783. What is their training?—They generally rise from Vaccinators. Vaccinators are instructed, and if they are found competent and dependable they are selected as Inspectors and Sub-Inspectors.

26784. *Prof. Gangulee* : They have no general medical training?—They have no general medical training.

26785. *The Chairman* : The Vaccinators are the lowest rung in the system?—The last is Vaccinators, but Vaccinators are not Government servants; they are employed by the Local Boards. The Inspectors and Sub-Inspectors are under Government.

26786. You have no Public Health Act?—We have no Act.

26787. Would you advocate one?—I very strongly advocate one.

26788. Do you find that the incidence of major epidemic diseases, cholera in particular, is largely seasonal?—Yes; I think it is.

26789. Have you worked that out?—There is work to be done in that connection. There has been work done all over India in that connection and I am following that work here.

26790. Do you think that the same applies to the hill districts?—Our experience is that we have very little cholera in the hills.

26791. But when you do get it?—Since I came here we have not had any.

26792. When you do get it, do you trace it to infection from the plains?—Yes. In Shillong, we had two small outbreaks; they have been traced to Sylhet, below Cherrapunji. We have a market (Bholaganj) there and the infection came from there. The people get infected in the plains and come here, and the incubation takes place here. When they arrive here, they are admitted to isolation hospitals. If they are in their own houses or boarding houses, the infection spreads. But it is never widespread here. When we do have an outbreak we at once have very intensive anti-cholera inoculation.

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26793. The water-supply of the hill tribes is good?—It is comparatively good; it is fairly free from pollution.

26794. What do you think about the drinking water-supplies of the population of the plains?—I consider them to be exceedingly bad.

26795. Do you think it is possible to improve them?—They can be improved.

26796. Is it within the economic possibilities of the situation?—Well, by the passing of the Stamp Act, a sum of three lakhs of rupees a year for three years has been promised to Local Boards for the improvement of their water-supplies. They have already had three lakhs, but I understand that has not yet been spent, because the money is not spent through the Public Health Department; it is given direct by Government to the Local Boards.

26797. That is on account of approved schemes?—They are allowed to have their own schemes; their schemes are not subject to criticism or examination by expert departments.

26798. Is that a wise arrangement?—In my opinion, it is not right.

26799. Who advises them on technical matters?—They have their own officers. Some may be qualified; others, I imagine, are not.

26800. Qualified as engineers?—Yes.

26801. What do they know about conservancy and sanitation?—I do not know.

26802. *Prof. Gangulee*: That amount of money was earmarked?—Yes, earmarked; they expected to realise a sum of ten lakhs of rupees.

26803. *The Chairman*: It was earmarked for drinking water-supply?—Yes. They introduced a Stamp Act.

26804. *Prof. Gangulee*: And that Act was to remain in force for three years?—I do not know the working of the Act; I have not a legal mind. But Government expected to realise a sum of ten lakhs of rupees, and that money was intended to be given in instalments of three lakhs of rupees for three years to Local Boards to improve their water-supplies.

26805. *The Chairman*: That was for drinking water-supplies?—Yes; that was meant for tanks and wells.

26806. Have you been consulted about that scheme at all?—We have in this Province a Public Health Board, and the Board expressed its opinion that there ought to be some provision about the manner in which this money was going to be spent, but we were informed that the Local Boards would have a free hand; they would get the money when they wanted it, and they could spend it as they liked. Subsequent to that the scheme was again sent to the Public Health Board, and we were asked to give an opinion. I, as Secretary of the Public Health Board, replied and said our opinion would not be worth the paper on which it was written, because we had already been informed that there would be no Government interference with the manner in which the money was going to be spent and when and where. It was brought to the notice of Government.

26807. So that, even if you found that a scheme were unscientific and would promote cholera, still the money would be paid?—Yes.

26808. What you have been saying does not mean that you would disapprove of a proposal to make the village or communal group responsible to carry out a scheme of hygiene and sanitation?—I do not think there would be any objection to that. On the other hand, we require legislation in order to force people to do what is right. Unless we have legislation the people will not do it, and we cannot do it. They expect Government to do everything.

26809. It is the experience in all other countries, however progressive, that you must have powers to impose standards?—We must have that power; I think that is only right. There would at the outset be some difficulties, but by a gradual process of propaganda and instruction people would take kindly to it.

26810. When people are not suffering from these epidemics they do not realise the value of these precautions?—They do not.

26811. Most people do not realise that until they are themselves attacked?—They do not realise until after they are dead.

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26812. Do you see any tendency on the part of local authorities to adopt progressive schemes of sanitation, conservancy and general hygiene?—They are perfectly prepared to adopt schemes provided they are provided with the finance.

26813. There was a scheme in which they were given money, and it was not insisted upon that they should follow good advice?—That is my complaint.

I hark back to that scheme, because that seems to me to be a very extraordinary thing.

26814. Do you associate the incidence of disease in the plains districts of this Province with the problem of malnutrition?—I think malnutrition has a lot to do with it, because if people are not sufficiently nourished, it follows that their constitutions are below normal and therefore they are more readily susceptible to infection.

26815. Are you thinking of deficiency in some constituent element of diet, or are you thinking of semi-starvation as a result of under-feeding?—It is both, and it is climatic too.

26816. They are quite separate problems, are they not?—Yes.

26817. Do you think sufficient work has been done on fundamental problems of deficiency in diet and malnutrition generally?—I think a considerable amount of work has been done.

26818. Would you view with satisfaction further work in that direction?—I think it would be very desirable to find out the calory value of the various foods.

26819. *Prof. Gangulee* : What are the chief sources of drinking water in the villages, tanks or wells?—In the Surma Valley, they are mostly tanks; in the Assam Valley, we have tanks and wells.

26820. Tube wells?—No; ordinary wells, most of them *kutchas* (bad).

26821. Liable to infection?—Very much so.

26822. Have any tube wells been sunk?—I have tried very hard to introduce tube wells. After considerable difficulty, I persuaded the Chairman of the Municipality of Dibrugarh to try this as an experiment. It was tried. They got a firm in Calcutta to come and carry out the work and a tube well has been sunk. It is a well of 5 inches diameter. Water of excellent quality has been found, sufficient to supply 18,000 to 20,000 people.

26823. At what depth?—Two hundred and thirty feet, well below the level of the Brahmaputra too. Owing to some difficulties, the matter now stands there. The Chairman of that Board has been changed and another body has been elected. There was no proper agreement between the firm and the Municipality, and the Municipality would not pay the firm what they consider their due. The matter is at a standstill. Meanwhile the well is gradually going to pieces.

26824. Badly managed?—The whole thing badly managed.

26825. I find from your Administration Report that the decision of the Legislative Council to extend the operation of the Assam Court-foes and Stamps Acts for another three years made an additional Rs. 3 lakhs available in the current year and, in accordance with the recommendation of the Council, the whole of this sum has been set aside for improving the rural water-supply, and the Boards have been allowed the widest discretion in framing their plans for spending the grants made to them?—Yes.

26826. How do you distribute the amount?—It has not been distributed by the Public Health Department; it is distributed by Government. As far as I know, the Local Boards were asked to submit schemes to Government through the Commissioners of both Valleys; these schemes came before Government, and Government allotted the money accordingly.

26827. Government did not examine the schemes?—I take it they examined them.

26828. *The Chairman* : Not from the public health point of view?—No; we were told that we must not interfere. They have a free hand to use the money as they like, dig their tanks or wells where they like and when they like.

26829. *Mr. Hazlett* : I do not think it is quite correct; I am under the impression that the money was made over to the Commissioners, who allotted

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it to the various Local Boards in accordance with local requirements?—I do not think so; the schemes came through the Commissioners to Government.

26830. The Commissioners distributed the sum to the Local Boards after having seen their plans?—The schemes came up to Government, and they were sent to the Public Health Board for an expression of opinion, but as we had already been told that we must not interfere, those schemes were returned.

26831. It is not interference; was any opinion expressed?—No opinion was expressed, because we were told that our opinion was not going to be acted upon.

26832. *Prof. Gangulee* : In the memorandum it is stated, "Local Boards are responsible for the sanitation of villages under their jurisdiction." Later on, reference is made to "Village Authorities"; who are these "Village Authorities"?—Under the new arrangements a group of villages is put together, and they are called "Village Authorities"; as far as I understand they elect their own little councils; it has only recently been introduced, it is a local panchayat really.

26833. Their work is not supervised by Government departments?—I should imagine their work is supervised by the Local Boards; the Local Boards delegate certain powers and responsibilities to the "Village Authorities", and they must be under the supervision of the Local Boards.

26834. What is the organisation you have for the registration of vital statistics?—In the Assam Valley it is done by *gaonburas*, who collect the vital statistics, and in the Surma Valley and Goalpara district it is done by *chowkidars*; they are the people who are responsible for collecting this information.

26835. Are you quite satisfied with the present arrangement?—No, it is very defective.

26836. Who inspects the village registers?—It goes to the local *thana*; a record is kept of the births and deaths and reported by the *gaonburas* or *chowkidars*.

26837. You have, I think, an Epidemic Diseases Act?—Yes.

26838. Do you find any difficulty in enforcing that Act?—We do not have much difficulty in enforcing the Act; at the same time, we refrain, as far as possible, from inflicting fines or punishments. We have not really yet gone to the extent of punishing anybody to that extent; we depend more on persuasion and threats.

26839. Do you find that the people of this Province are averse to vaccination?—In parts, yes.

26840. In other Provinces, we are told, they have schemes to attract medical practitioners to rural areas; have you any such scheme here?—We have no such scheme; that is a question for the Medical Department.

26841. You have a Public Health Laboratory?—Yes.

26842. What is the nature of the work done there?—We analyse and report on water-supplies and we examine and report on all the different foodstuffs.

26843. Do you have representatives of the Local Boards on the Public Health Board that you mention?—No; we have on the Board the Chief Engineer of the Province, the Inspector General of Civil Hospitals, the Director of Public Health and an Indian medical gentleman.

26844. *Mr. Culvert* : Is it true that the hill people hereabouts do not drink milk?—They do not, as a rule; the Khasis and most of the hill people do not drink milk, because they look upon it as an excretion.

26845. Does that have any deleterious effect on their general health?—I do not know that it has, because they are generally meat eaters.

26846. *Rai Bahadur R. M. Das* : Is it the case that the local Council was not at first inclined to extend the Stamp Act and the Court-Fees Act for another period of three years, unless the revenue derived from this source was earmarked for some purpose of public utility?—I understand there was something of that nature, I do not know that it existed officially.

26847. The Council insisted that the whole of the amount should be given over to Local Boards for the improvement of rural water-supply?—I think there was a promise of that nature.

26848. On that distinct understanding, these two Acts were extended by the Council for another three years?—I think so.

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26849. As regards propaganda work, you say that booklets on small-pox and other diseases are periodically issued by your department?—Yes.

26850. What percentage of the population in this Province are literate?—I should imagine it is not very big.

26851. I will tell you that not more than 5 per cent or 6 per cent are literate. Do you think that by these publications, you can reach the major portion of the people for whom these pamphlets are intended?—We give them practical demonstrations; there are magic lantern demonstrations, and if they are sufficiently interested, as I know some people are, they get the contents of these booklets read to them.

26852. You say that your magic lantern demonstrations are confined only to *kala-azar*?—They are confined to the principal diseases which affect this Province.

26853. But here you have said that they are confined to *kala-azar*?—That is the one that really concerns us most; plague, which we do not have in this Province, does not enter into our propaganda work.

26854. How many Assistant Surgeons on *kala-azar* duty have you got just now?—Six.

26855. Are they working in all the districts?—They are working in the *kala-azar* infected districts.

26856. How many districts?—Six districts.

26857. They only work in the infected areas?—Yes, because it was found to be the only and the most economical way of starting propaganda work; propaganda of this nature has not been done in the Province before; it is a matter which has only been taken up in the last two years.

26858. They only touch the fringe of the population?—Yes, but it is doing something, and it is enlarging; the work is gradually growing.

26859. Do you not think that some system of well-organised propaganda work should be undertaken by Government?—It is a question of finance.

You admit 95 per cent of the people are illiterate; is it not a waste of public money to issue these pamphlets and booklets whilst 95 per cent of the population are illiterate?

Mr. Calvert: If you had 400,000 literate people, why not speak to them?

26860. Rai Bahadur R. M. Das: Could you suggest some such well-organised propaganda work for the rural tracts?—If you could get people to go round and lecture in the vernacular languages on various diseases, I am perfectly prepared to acknowledge that we could have a much better hygiene or public health propaganda organisation in the Province.

26861. Do you know the Sylhet Social Service League?—Yes; that is the only body of its kind in the Province.

26862. Are you in touch with the work of this League?—Yes.

26863. Do you get reports from them periodically?—I get them periodically, as to where they have been and given their demonstration lectures.

26864. Would you like to see an extension of the work of organisations like the Sylhet Social Service League?—I would welcome it gladly.

26865. Would you suggest to Government that such institutions should be encouraged and organised in other parts of the Province?—If the people would do the organising themselves.

26866. The Sylhet Social Service League has been organised. Have Government helped this League?—Yes; this year they got Rs. 500 from the discretionary grant at the disposal of the Hon'ble Minister for Local Self-Government.

26867. Sir Thomas Middleton: Mr. Calvert asked you about the use of milk by the Khasis; till what time does the Khasi mother suckle her infant?—As long as she is able to.

26868. What happens afterwards? The children get no milk?—They probably do not; they probably feed them on syrups and things of that sort.

26869. Mr. Heslett: Is it not the practice that, when the hill mother has no milk, she chews the rice and puts it into the mouth of the child?—That is so.

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26870. *Sir Thomas Middleton*: With reference to the use of sugar in jails, you give a list of common foods showing the percentage of carbo-hydrate, and you say that these common foods are not preferable or superior to sugar or its derivatives. Should you not have added "as sources of carbo-hydrate"?—That is implied; it is only a question of carbo-hydrate.

26871. That would have been implied, but you state quite definitely afterwards: "In my opinion, it is desirable that sugar or its derivatives should be used in jails;" should you not have qualified it by saying "if it is the cheapest source of carbo-hydrate"?—I do not think it is the cheapest source of carbo-hydrate; it will be more expensive.

26872. The other foods which supply carbo-hydrate also supply other things which must be given?—Yes.

26873. Are these sufficient?—I should imagine so; the jail authorities must have worked out the calorific values of these foods.

26874. I was not thinking of the calorific value; in this instance I was thinking of making up a diet with enough protein and fat?—They have probably worked it out, so that each prisoner gets a sufficiency of food with regard to the special task he is put to.

26875. If they did reduce the ration of one of these other foodstuffs they would cut out some protein?—They ought not to; they should not do it.

26876. Do you mean to say that if you cut out part of the rice you would supply prisoners with an equivalent amount of protein from some other source?—On the other hand, there may be an excess of protein.

26877. That there never is?—It may not be.

26878. *Mr. Hezlett*: Supposing Government give a Local Board Rs. 15,000 to spend on drinking wells and tanks, what particular problems do you think should be referred to your department? The first question would be where such tanks and wells should be constructed in the villages. Would your department like to interfere and say that these tanks and wells should be constructed at such and such places in the village?—Provided we have got a Public Health Engineer, it should be referred to him, because he will have great experience and a working knowledge of sanitary engineering.

26879. We have not got a Public Health Engineer in this Province; in his absence who is to decide the question of site? Do you think Local Boards have sufficient knowledge of the locality to be able to say which place is worse off for water-supply and so forth? Are they in the best position to decide the site of these tanks and wells?—They might select a site for a tank which might be an excellent one, but when they came to dig that tank they might find the ground would not hold water; that is an engineering problem.

26880. You have got no engineer in the Public Health Department who could help them?—No.

26881. So if we refer the question of site to you, you will say that you cannot pass an opinion on it?—I am concerned with the quality and quantity of water and not with the engineering problem.

26882. With regard to the question of site, the present Public Health Department cannot help the Local Boards and therefore they have got to depend on their own engineer?—Yes.

26883. Then with regard to the type of well to be sunk, which is another problem, could your department advise the Local Boards as to which type of well should be dug, whether tube well or masonry well or *kutchra* well?—Yes.

26884. Have you any staff to help the Local Boards in that way?—No, but that matter would be referred to me or to my Assistant Director.

26885. How would you advise the Local Boards as to whether a particular well should be a tube well, masonry well or ordinary *kutchra* well?—We have plans in our office.

26886. So you would be able to advise the Local Boards with regard to the type of the well?—Yes.

26887. You are generally of opinion that a local body should be controlled to a greater extent by technical authorities?—Yes; I think so.

26888. Otherwise Government money is not spent in the way that it ought to be?—Yes.

(The witness withdrew.)

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**Mr. MOHENDRA MOHAN LAHIRI, B.L., Pleader,
Gauhati, Assam.**

Replies to the Questionnaire.

Though I am a pleader by profession I have always taken considerable interest in agriculture and gardening. In fact agriculture has been my life-long hobby. For more than twenty-five years I carried on agricultural operations with six to eight ploughs and grey paddy, mustard, sugarcane, pulse, jute, etc. I imported fine varieties of paddy from Bengal. With the help of the Agricultural Department, I tried to manufacture gur in an improved process known as Hadi's process and also got the loan of a centrifugal machine and manufactured sugar one year. I purchased different kinds of American ploughs and also Meston ploughs on the recommendation of the department. I was an Honorary Correspondent to the Agricultural Department for a long time. I gave some attention to fruit culture and tried oranges, coconuts, pineapples of different good varieties (Kew, Queen, Sumatra), plantains, litchis. As good watermelons are not grown here, I brought some seeds from Bengal and tried the same in the Brahmaputra *chur* close to Gauhati. My vegetable garden was always very successful. My cabbages, caulis, etc., were often the biggest in this town. I always keep cows. I tried different kinds of imported varieties of milk straiy. On account of advanced age, I cannot now take active interest in agriculture. I do not study any agricultural literature now and I am no longer in touch with the department. I base my replies only on my personal experience.

QUESTION 1.—RESEARCH.—There can be no doubt that this is one of the most important branches of agriculture and at the same time most difficult. Future improvement of agriculture depends on the result of research. In India, it is very difficult to find competent skilled workers and laboratory facilities for study are also very limited. By providing funds laboratory facilities may be improved, but it is not easy to secure the services of skilled workers.

In some foreign countries agriculture has developed highly and exports may be imported from there but Indian conditions are very different from these countries. I do not think that without fresh research here, the expert knowledge acquired there will be of much use to us in India. The costs of maintaining a service with foreign experts will also be very high. I believe the agricultural colleges we have in India are not fully equipped with all modern improvements. Indian students do not get their proper training to enable them to acquire knowledge which will fit them to be experts.

The only possible way is to establish agricultural colleges in India, to train up men who can afterwards take up research work successfully. Considering the vast area of India and the large number of people who depend on agriculture it is only just and proper that the expenditure of the Agricultural Department should be considerably increased. At present it is a department in name only. Unless more money is spent and more men are employed, greater facilities given for research work, the department can do no useful work.

I do not think I shall be very wrong, if I say that in India—at least in Assam, we have no agricultural experts who can render practical help to the people. Qualified agricultural chemists are wanting.

Fruit growing is always a very lucrative industry. We ought to have experts who after analysing the soil can advise people as to what kind of fruit can be grown on a particular plot of land. Instances of people wasting their money and labour by growing fruit trees on land utterly unfit for the same are very common. If before starting any fruit orchard, one can on application to the department get the help of an expert who after making necessary examination of the soil can give him proper advice he will not meet with such disappointment. I may state my own experience and cite some instance in point.

Oranges grow well in Assam. As the soil in Bengal and other neighbouring Provinces is not suitable for oranges, and as even in Assam such suitable land is very limited, an orange grove is very profitable in Assam. Orange trees live long and the maintenance charges of an orange garden are very small—almost negligible.

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I therefore started a small orange garden twenty-five years ago. The trees grew well. They yielded good fruits for eight or nine years. I then opened a new orange garden on a bigger scale. In the meantime the trees of my former garden began to die and in two or three years, all the trees, about one thousand in number, died. I inspected many other gardens in this district and found on inquiries that many other new trees met with similar fate.

We ought to have experts who can ascertain the cause and suggest a remedy to stop this wholesale destruction of valuable fruit trees. In America where orange is grown extensively, in a case of this nature the owner applies for Government help, an expert is deputed who after necessary analysis and inquiries suggests remedies which successfully check the destruction, and valuable property is saved. My own theory is that the natural plant food the soil contains is all exhausted and an agricultural chemist can find out what kind of manure will have to be mixed up with the soil to make up the deficiency. A kind of insect pest known as borer also causes considerable damages to orange trees. It cuts open the bark and enters into the wood of the trees and kills it. An expert ought to be able to find out means to prevent borers attacking the trees.

In Assam, though there are plenty of mango trees, good fruits are not available. Assam mangoes are full of maggots. In some parts of Bengal also, mangoes are unfit for human use on account of similar maggots.

These facts are within the knowledge of the Agricultural Departments, but no serious attempt has been made to study the question and to make any research with a view to find out a remedy. I brought a book from America on orange cultivation but I found that conditions there are quite different, the insect pests are of different kind and the remedies tried there will be of no use here. This will also show that expert knowledge of one foreign land will not always solve the difficulties of another distant land where climatic conditions are different.

In Assam, we get only one crop of oranges during a year but, in Nagpur, the orange trees yield two crops. Whether it is possible to get two crops is worth considering. I brought some orange grafts from Nagpur through the Agricultural Department which have grown well but give only one crop.

QUESTION 2.—AGRICULTURAL EDUCATION.—There is no agricultural school in Assam. There are primary schools in rural tracts where the children of the agricultural classes as well as those of the middle classes get their elementary education. In villages, most of the middle-class people have also their own land and cultivation. The only difference is that middle-class people do not plough with their own hands but employ labourers. Both classes are therefore almost equally interested in agriculture and depend more or less on the produce of their lands. Agriculture is not taught in these schools. In Class IV, the curriculum provides under the head "Drawing and Hand Work" drawing of agricultural implements and modelling of such implements in wood with knife. This is only a farce. As the Assamese mostly live on agriculture, the primary schools in rural tracts ought to be *real agricultural schools* where boys can acquire knowledge in agriculture. The curriculum of such schools ought to include such subjects as selection and preservation of seeds, use of manure, advantageous sale of agricultural produce, taking care of cattle, making agricultural implements, mode of tilling and sowing, etc. There ought to be small farms attached to these schools where they can get some practical training in improved method of tilling. The boys can then after leaving their schools carry on their agricultural work in a better and more efficient manner than their elders. The education a boy gets at present is not only not useful, but is quite harmful, because it makes him quite unfit to be a cultivator. He leaves school with the idea that it is derogatory to do any manual work and refuses to till his own land. He is a loss to the family.

We have no competent teachers now. It will be necessary to train up teachers first. It is desirable that the teachers should be recruited from the agricultural classes. Schools will have to be established for teachers. At present there are no proper books on agricultural subjects; such books will have to be written. Up to this time no real endeavour has been made to grapple with this most important matter properly, so the beginning has to be made now.

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In my opinion, a middle-class youth cannot maintain himself by cultivating such staple crops as paddy, mustard, pulse, jute which are usually grown by an ordinary cultivator, unless he changes the existing mode of cultivation. One who employs hired labour cannot compete with one who cultivates with his own hands if both grow the same crops under similar conditions. I have taken a great deal of interest in this matter and have tried my best to ascertain by actual experiment if a middle-class youth can adopt agriculture as his only means of livelihood. With this object in view I took up land and grew paddy on a pretty large scale. I maintained eight ploughs and necessary number of bullocks and labourers. Labour then was cheaper than now. I continued the experiment for twenty years or more, and though I never suffered any loss, the margin of profit was not much. When paddy was sold at Rs. 3 per maund there was profit of about Rs. 6 per *bigha*, but when the price was lower, there was no profit. I grew sugarcane and manufactured fine *gur*, but the profit was very low. The late Mr. N. G. Mukherji, who held the office of Deputy Director of Agriculture in Bengal, and wrote a useful manual on Indian Agriculture, was also of the same opinion.

If cultivation is carried on an enlarged scale and modern improved methods and machinery be used, the case may be different; but middle-class youths cannot raise the capital necessary for such purpose.

Fruit growing will however be a profitable occupation for middle-class people. In Assam betel-nut, coconut, liches, plantain, orange and other kinds of citrus fruits, pineapples of imported varieties (Kew, Queen, Sumatra) can be grown in abundance. The allied industry of preservation of fruits and manufacture of various valuable by-products will also be very profitable.

Agriculture can be made attractive to middle-class youths by granting land to them at special favourable rates and giving loans on easy terms to enable them to introduce improved methods of cultivation by machinery. The policy of Government, I am sorry to say, is far from sympathetic in the matter of settlement of land with middle-class men. They do not get any encouragement from Government. They are looked upon as middlemen and speculators, and, as a rule, in settling land, preference is given to actual cultivators. Recently, in some places a condition has been inserted in periodic leases granted by Government restricting the sale of land by a cultivator to a middleman. I am not unmindful of the fact that moneylenders will get an opportunity to purchase land from needy cultivators if there is no such restriction in the lease, but to protect the cultivators from the grip of the moneylenders is another matter of vast importance which ought to be dealt with differently. The mentality of young educated men of middle class, I am glad to say, has undergone a complete change for the better. They are quite willing now to take up agriculture as a career; many of them have no objection to plough with their own hands and to undertake any other manual work if they find that they can make a decent living by doing so. Many of these youths are now entering as apprentices in various European workshops (Indian workshops being very few in number) and doing the necessary manual work with pleasure. Many are disappointed in not getting admission as apprentices: they have proper education, they are quite intelligent and what is more they come with a willing heart and if we cannot guide these youths properly and they swell the number of unemployed the blame is not theirs. It is very easy to convince these educated youths about the benefits and advantages of various improved methods of cultivation and, if they adopt the same, the illiterate cultivators will also follow them. Not only will the unemployed educated youths succeed in turning out to be substantial farmers themselves, but their success will be the best means of convincing the cultivators of the advantages of improved method of agriculture.

Government can do a great deal to help these youths by granting them land and giving them loans for purchase of machinery and directing the Government experts to give them proper advice and generally to supervise their work.

The officers of the department ought always to bear in mind that they are servants of the public and that their principal duty is to advise and render all assistance to the cultivators. They ought to form the acquaintance of all leading cultivators and inspire confidence in them. They can arrange lantern lectures on agricultural subjects. In every district there

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ought to be a standing agricultural-committee consisting of official and non-official members who take interest in agriculture, whose duty will be to act as a sort of advisory body to the department. This committee can do a great deal to popularise the department.

It is rather difficult for a layman like myself to suggest any practical scheme and its administration and finance without any discussion with Government officials and without having proper statistics before me. I can only say that I believe with many others that the money now spent for the maintenance of the department is not money well spent. I do not blame the officers of the department most of whom try to do their difficult duty as best as they can. The department is handicapped for want of properly trained experts and also for want of funds. It is a neglected department. The expenditure of the department ought to be very considerably increased to make it efficient and useful.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—In every important centre, a demonstration farm ought to be established; the officers in charge of the farm ought to see all the leading cultivators of the locality and explain to them the improved methods adopted by them and if they find that the produce of the farm is much larger than theirs, I see no reason why they will not be convinced. The middle-class educated youths who with Government help introduce improved methods may also help in this matter. It may be made a condition of the help they get from Government that they will have to do propaganda work like this.

QUESTION 4.—ADMINISTRATION.—The services afforded by the department are not satisfactory. They have not been able to inspire confidence in the public. There is want of competent experts, who can render any practical assistance. Agricultural committees as proposed by me will be useful.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) In Assam, cultivators mainly depend on the paddy and when that fails, they have to borrow; during the ploughing season a bullock dies, falls ill or is killed by tiger; during the progress of cultivation he finds that his stock of paddy which he thought would carry him to the end of the season, is used up. On these occasions he borrows and on any terms he secures a loan. He agrees to give eight maunds of paddy as hire of the bullock and half the quantity of paddy borrowed by him as interest. Marwari traders and village moneylenders lend the money. If the crop is sufficient, he can repay but otherwise he cannot pay off his debts.

(b) Co-operative credit societies ought to be able to lighten the burden or debt. Money ought to be lent to an agriculturist on the mortgage of his land—the amount to be repayable by instalments extending over long periods—ten to twenty years. In this connection, I am glad to state that on the initiation of the present Director of Agriculture, a co-operative land mortgage bank has been established in Kamrup district with a view to enable small landowners to save their lands which are heavily mortgaged. I am one of the Directors of the bank and I entertain great hope about the future usefulness of the bank. Such banks ought to be established in all important centres.

(c) I am not in favour of limiting the right of cultivators to their lands by restricting their power of sale and mortgage. It will reduce the value of the lands. The existing law allows the civil courts to interfere when the interest is high and unconscionable.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—I am afraid that according to the Hindu and Mahomedan laws of succession fragmentation of holdings is inevitable. I do not see how, without changing the law of succession, which is out of the question, it is possible to prevent subdivision of holdings. When a cultivator on succession gets a small piece of land not sufficient for his maintenance, he acquires other land and in this way holdings are often consolidated. Necessity compels a cultivator to consolidate his holding by purchase or exchange.

(c) I do not think that the suggested legislation is necessary. It is no doubt desirable to keep disputes out of court, but no country has succeeded in doing it.

QUESTION 8.—IRRIGATION.—In Assam—at least in Kamrup—I am not aware of Government having taken up any irrigation scheme in hand. There are big rivers and also many small hill streams. It is certainly

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possible to utilise some of these for irrigation purposes. There are instances however of cultivators combining and digging long canals to irrigate their own land also putting *bunds* (embankments) in small streams for that purpose. In such cases as the land is improved, Government charge higher rent for it; in other words, instead of encouraging such enterprise, an extra tax is charged on the labour of the ryots. This does not seem to me to be at all equitable. Nature is very kind in Assam. There is plenty of rain. Tanks, ponds and wells, though needed for drinking water, are not required for agricultural purposes.

QUESTION 10.—FERTILISERS.—The cultivators generally do not even use their own cowdung. Sometimes they sell it to neighbouring tea planters and sometimes other people take it away without paying anything. It will be difficult to induce people to purchase manure when they do not use their own. As they grow only one crop in the year, manure is perhaps of not such importance to them.

QUESTION 11.—CROPS.—The department I believe is making investigations to find out the most heavy yielding variety of paddy. *Indrasail* paddy of Bengal is distributed by the department and, so far as my experience goes, it is a suitable variety.

The principal crop in Assam is paddy which may be divided into three main groups:—

- (1) Transplanted paddy.
- (2) *Bao*—which is sown broadcast on land which goes under water during the rains.
- (3) *Aus*—which is sown on high lands.

The first one is the most important as it is grown more extensively than the other two.

Practical experience of ages is a great asset to the cultivators and I believe they know very well how to grow this staple crop. Except in the matter of selection of seeds and the use of manure, very little can be done to help them in improving this crop.

It takes six or seven months to grow and reap the paddy and during this period the cultivators tend their cattle but, as soon as paddy is harvested, they let loose their cattle which graze freely. The result is that those among them who intend to grow any other crop cannot do so unless they fence round their land which will involve considerable labour and cost. In other words, a ryot cannot make profitable use of his land because his neighbours do not look after their cattle. I think this practice is greatly responsible for Assam ryots not growing a second crop on their land.

Some ryots grow mustard, jute, sugarcane, pulse, on a very small scale generally for their own use. There is room for extending their cultivations. Immigrants from Mymensingh and other neighbouring districts of Bengal, mostly Mahomedans, have now been settling in Assam and they have been growing jute and other crops on an extensive scale. They are hard-working and as the prices of all agricultural produce have gone up they are getting rich and trying to invest their money in the purchase of land from their Assamese neighbours. There is a great future for the jute industry in Assam. Wild animals cause considerable damage to the crops and cattle are also often killed by tigers. Licences for guns ought to be granted to the cultivators more liberally.

QUESTION 12.—CULTIVATION.—The old primitive Indian plough is often the subject of ridicule. We nowadays hear of improved ploughs and scientific agriculture. As far as I know, however, nobody has yet found out a plough which can be the substitute for this simple plough which can be used by the cultivators in mud and water to prepare land for transplanting paddy. The improved American plough and other ploughs may be used in tilling high land or low land when dry but they are quite unsuitable for land on which paddy is transplanted—the main object in such case being to mix up earth with water and to prepare deep mud. This is the reason why this traditional Indian plough still holds its ground. I tried some improved types of American plough but found my Assamese cattle too small and weak for them. The Meston plough is smaller and some attempt has been made by the department to introduce it but it has not been successful. These improved ploughs may be worked with buffaloes in tilling high land but Assamese cultivators generally prefer cattle to buffaloes for various reasons.

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A small motor plough of the type of Indian plough which can be worked by one man may be useful to open high land but I think the cost of liquid fuel will be more than the food of a pair of buffaloes and the initial cost of purchasing it will be beyond the means of an ordinary cultivator. Motor ploughs and tractors may be used by middle-class men if trained men to drive them or to teach others to drive them are available.

QUESTION 14.—IMPLEMENTS.—My idea is that an Assamese cultivator, if he is convinced that improved agricultural implements will increase his crops, will go in for them if the prices are not beyond his means. The use of improved sugarcane-pressing machine may be cited as an instance. Formerly the cultivators used a crude wooden crusher. Some manufacturers let out their iron sugarcane-crushers on hire and the cultivators now use them in preference to their crude machines. Well-to-do cultivators now purchase these improved sugarcane-crushers and let them out on hire to their poorer neighbours. Machinery will be too costly for individual cultivators. Unless a proper type of improved plough suiting the requirements of a poor Indian cultivator can be devised and machinery suiting Indian conditions can be manufactured, I see no chance of any improvement in this matter.

Co-operative societies under the supervision of the department may be formed to purchase implements which suit the Indian cultivators and these may be let out on hire just in the same way as the sugarcane-crushers. Thus with the help of these societies improved implements may be introduced. The department however will have first to prove the efficiency of the machinery and other implements by actual demonstration. Landholders and well-to-do middle-class people who own land may be quite willing to purchase such machinery and carry on agriculture on a large scale if it is profitable to do so. They must however be assured of the real usefulness of the machinery. They cannot undertake the risk of purchasing costly machinery for mere experiment. One gentleman here has purchased a tractor for his son by actually borrowing the money, but the boy has not been able to work it properly. Others also here have tried tractors without success. These failures seriously retard the introduction of new machinery.

QUESTION 15.—VETERINARY.—The Civil Veterinary Department ought to be a branch of the Agricultural Department and placed under the Director of Agriculture. There are very few veterinary dispensaries in Assam and people have no faith in the efficacy of treatment there. Assamese cultivators spend very little for their own medical treatment and it can hardly be expected that they will do more for their cattle. With the spread of education, people will learn to appreciate the usefulness of these institutions.

QUESTION 16.—ANIMAL HUSBANDRY.—Assam cattle are poor in size and strength. The cows give very little milk—generally not even half a seer. Climate may have something to do in the matter. I have tried different kinds of cows and they have proved more or less unsatisfactory. Multan cows give much less milk here and within my knowledge three or four of them became barren after giving three or four calves each. Bullocks for carts have all to be imported from Bihar and good plough bullocks are also imported. The price of imported cattle is very high, so it is absolutely necessary to improve the breed of plough cattle as well as milch cows. Assamese cultivators do not plough with bulls. They castrate the young bulls by a crude painful process when they are three or four years' old and as they do not keep any bull for breeding purposes, the calves are progenies of these young and immature bulls. It is therefore necessary to import suitable bulls. Considering the apathy of the cultivators in this matter, it is the duty of Government and Local Boards and Municipalities to keep sufficient number of bulls. I understand that near Gauhati a Government farm for breeding purposes will be soon opened. There is also a Government Dairy Farm at Shillong but the bulls and heifers of this farm cannot stand the hot climate of the plains. I got three heifers from this farm two of which died. The department by careful inquiries ought to find out the variety best suited for Assam. Bulls of big size will not suit. Assamese cultivators take very little care of their cattle. They make some arrangement to feed their plough bullocks when actually employed in ploughing but generally the cattle are let loose and are supposed to take care of themselves. The cattle sheds are not kept properly. The floor is often full of holes where urine accumulates and it is a pitiable sight to see cattle in such sheds.

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DAIRY.—It is difficult to get good milk. Price is very high. Nepalese graze buffaloes in jungles and supply milk and *ghi* but though the prices of these articles are very high, they are not prospering. The grazing tax realised by Government—3 rupees per buffalo and 6 annas per cow—seems to be very high and is to a great extent responsible for the depression in their trade and the poor supply. Government recently proposed more stringent rules and their wider application, but on account of public opposition they were dropped. The policy of Government does not seem to be wise. Instead of encouraging people to open dairies, Government is trying to put obstacles in their way by trying to increase grazing tax. Fodder shortage is most marked from December to March. The cattle look quite lean and famished and when, after early rains in April, grass grows they begin to thrive and in June they look quite healthy. If fodder is grown in Government reserves, people may be allowed to use it on payment of small fees.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—In Assam, women do considerable agricultural work which is not done by women of other Provinces. They go to the fields, transplant paddy and reap it; they also do household work and weave cloth; they keep goats, rear poultry and silk worms and do lots of other useful work. The male persons plough land, collect fuel, thatching grass, repair their homes and have sufficient work for some nine months in the year. A good cultivator tries to grow everything required for his own household, but just sufficient for his own purpose and not more. He has sufficient knowledge of these industries and there is considerable room for expansion and improvement. His standard of living being low, his wants are very few so it is difficult to induce him to resort to these industries in a bigger scale. It is necessary to raise the cultivator's standard of living first.

People are always reluctant to introduce any change but I am sure that with vigorous attempt to demonstrate the advantages of improved looms and agricultural implements they will gradually adopt them.

I have some experience of rice hulling industry as I have started a small rice mill which is managed by my sons. There are about one dozen such mills in this district. These mills have not been able to attract Assamese labour. The railway companies, steamer companies, tea gardens and other industries have all to depend on imported labour. Assamese cultivators are averse to any such hard work.

I believe, however, that people will take part in many industrial enterprises if they have personal interest in them. I, therefore, suggest the following scheme which I think will turn an agricultural centre into an industrial centre also. In an important paddy centre a co-operative rice mill factory under Government supervision can be started where all cultivators can husk the paddy required for their own use and also any surplus which they want to sell. In that case, they will be able to sell rice instead of paddy at an extra profit. They will be able to repay the money they borrow from the profits of the mill. Along with rice mill there may be oil mill and sugarcane-crushing mill which can be all worked by the same engine in the same factory. The villagers will be able to crush their sugarcane and mustard in these mills and sell the finished products at higher prices—neighbouring cultivators will also be allowed the use of these mills on reasonable terms. The sale of agricultural produce through middlemen will be avoided and all profits of the mills which now go to the pockets of some rich and enterprising men will go to the growers themselves. The primitive *dhenki* with which they husk paddy now and crude sugarcane-crushers and oil pressing machines will be entirely eliminated. It is an experiment worth trying and its success will improve the condition of the agricultural classes greatly.

QUESTION 19.—FORESTS.—Assam is said to be a land of jungles but it is a curious fact that we have to purchase jungles here at an exorbitant price. Thatching grass or reeds which grow wild in the *churs* of the Brahmaputra are sold at such high prices that people here consider it much cheaper in the long run to build houses with corrugated iron sheets. Wood fuel is so dear that in the town of Gauhati many people are using coke. Scarcity of labour seems to be the main cause.

QUESTION 20.—MARKETING.—Paddy and mustard are exported from Assam mostly by Marwari traders. They mostly purchase direct from the growers. As many rice mills are started now in this district the cultivators

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can easily arrange to sell their paddy direct to the mill owners. If under Government supervision and aid, co-operative societies are started the cultivators can, with the help of the societies, sell their surplus paddy and other agricultural produce direct to the purchasers.

Societies will have godowns in suitable places and when a cultivator is in need of money, he can carry his stock to the nearest godown and take some money as advance and after the disposal of the grain collected in a godown accounts may be finally adjusted. The societies can deal direct with the mills and other purchasers.

QUESTION 22.—Co-operation.—There is a vast field for expansion of all kinds of co-operative societies in India. In the present state of things when suitable men are not available the societies ought to be under Government supervision. Purchase societies are almost unknown in Assam. I think such societies will be very useful if the main object be to help the poorer cultivators to sell their surplus grains at proper prices and to save them from the moneylenders.

Oral Evidence.

26889. *The Chairman* : Mr. Lahiri, you are a pleader from Gauhati?—Yes.

26890. You have provided my colleagues and myself with a very interesting and very full note on the points which you wish to lay before the Commission and I will proceed to ask you one or two questions?—If I had had time, I should probably have written a better note; I was in a hurry and so could not do full justice to it.

26891. I think it is a very good note, if I may say so. In the opening paragraphs you suggest that a better service might be provided by the Agricultural Department. Do you think it might cost more than the present service?—It will cost much more than the present service.

26892. Do you suggest that the funds for the better service should be found by allotting a larger proportion of the existing revenues to agricultural purposes or by an enhancement of taxation, or by both?—Probably by both.

26893. Do you think that the Province could stand an increase in taxation?—I think so, if the money is earmarked for agricultural improvement and is really well spent.

26894. You give us a very interesting account of your own wide experience in farming. Have you any experience of potato growing?—I have tried it but that is not worth mentioning.

26895. It is a very important part of the cultivation in these hills; is it not?—Yes.

26896. I see on page 180 you say "The officers of the department (that is the Agricultural Department) ought always to bear in mind that they are servants of the public and that their principal duty is to advise and render all assistance to the cultivators." No doubt all officers of Government have to remember that they are paid to be public servants, but do you suggest that there has been default in that respect?—The cultivators do not know them and probably they are to blame for it and not the cultivators. It is the duty of Government servants to seek the people, advise them and let them know that they exist for their benefit.

26897. You feel that there is need for a progressive policy in research and administration and you think that, provided the cultivator is assured of a reasonably substantial return, he will not prove to be over-conservative?—That is my impression.

26898. I am very much interested in your experience in the matter of animal husbandry. On page 183 of your note, you say that you have in your day kept a dairy herd and have tried various strains of cows. Could you tell us quite briefly what strains you have tried?—I only kept some cows for my own house.

26899. I did not mean on a commercial scale. What breeds have you tried?—I tried the Multan breed; I also took some heifers from Shillong which are known as Taylor's breed; they come from Patna.

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26900. I wonder whether you have yourself imported animals from other Provinces?—I brought some from Serajgunj in Bengal. A gentleman also got some cows but somehow or other they did not prove successful.

26901. Where did they come from?—They came from Patna.

26902. Did you get any progeny from that stock?—That stock was an entire failure.

26903. Did they all die before they could have any calves?—Yes.

26904. You cannot from your experience say definitely that the stock deteriorates as a result of importation into the Province?—I have said in my note that the Multan breed does deteriorate. The Multan cows that I had gave less milk here than in other parts of India, and after giving three or four calves some of them became barren.

26905. *Sir Henry Lawrence* : Are you making that statement from your personal experience, did you know the milk record of those particular cows before they came into this Province?—That I cannot guarantee.

26906. It is very important to discover, if possible, whether there are environmental conditions in the Province which are to a greater or less degree inimical to the health and life of the cow?—Several gentlemen from Gauhati brought Multan cows from Patna and other places; some purchased them from *melas*.

26907. *Prof. Gangulee* : From what market did you buy your Multan cow?—It was brought by a European gentleman and I purchased it from him.

26908. *Sir Henry Lawrence* : What became of these calves of the Multan cows; did you rear them?—Some of them died and some of them are living still.

26909. Are they giving good milk?—They are not as good milkers as their mothers were.

26910. Who was their father?—It was not really a Multan bull; they are not available here.

26911. With what kind of fodder did you feed your Multan cow?—The best that I could get in Gauhati.

26912. What was its breed?—It was of mixed breed; she was a little bigger in size than the ordinary cow.

26913. How did you get these Multan cows; were they brought round to your farm by some travelling seller or what?—The cow that I had was brought by a European gentleman and I purchased it from him.

26914. How much did you pay for that cow?—I paid about Rs. 200 for the cow and two calves.

26915. How old was the cow?—I was told that she had only given birth to two or three calves.

26916. *Sir Thomas Middleton* : You say that it is desirable that teachers should be recruited from the agricultural classes. We have been told that when men are taken from the agricultural classes and become teachers they despise agriculture; is that your experience?—At present we cannot have agricultural teachers unless we train them; no beginning has been made yet. We have no books, we have no teachers and no proper schools. That is my own impression.

26917. You are one of those who do not despise agriculture but we are told that most educated people in Assam do despise it?—That was the mentality before, but I think many educated young people are now quite willing to take up agriculture as a career.

26918. You have shown a good example but other people have not followed it?—I have not been very successful.

26919. *The Chairman* : You have done your best?—Yes; but I have not been very successful.

26920. *Dr. Hyder* : How many acres would be required in Gauhati for a middle-class man to settle on the land? He must work on the land himself with his own hands like an ordinary cultivator?—I have stated in my note that it will not pay.

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26921. Then there is no chance for the middle-class people?—I maintain that by growing ordinary crops, a middle-class man cannot compete with a labourer who grows it himself. If the conditions are the same and if the mode of cultivation is the same, then he cannot compete with the local labourer.

26922. If he himself works with the assistance of hired labour?—He has better brains but as a labourer he will be inferior to an ordinary labourer.

26923. *Mr. Hazlett*: On page 180 of your note, you say that Government will not lease out land to men of the *bhadralog* class. I do not think that is a correct statement. If a middle-class man satisfies the Land Records Department that he is going to cultivate himself or by his servants, then Government policy, so far as I understand it, is to give that man the land he wants?—That may be the policy but it is very difficult to convince the Government officers that I am taking the land not for speculation but for cultivation.

26924. Do you not think Government must provide against men taking up land and leasing it off to tenants and so starting little estates of their own? Government does not want any middlemen between themselves and the actual cultivators of the soil, and that is the principle they work on. If a middle-class man wants to take up land and cultivate it himself, Government will give him the land he requires. I do not think your statement is quite correct there?—It represents my experience.

26925. You refer to the new condition in the leases of 1919. That refers not to the middle-class man, but to the man who lends money?—No, it is that the cultivator is not to sell land to any other man who is not a cultivator.

26926. He could sell the land to a middle-class man who was a cultivator. As regards the assessment of improvements made by the tenant himself, that has already been dealt with and Mr. Scott has explained the policy of Government?—I think what I say is correct.

26927. No. You should look at rule 100 on page 203 of the *Land Revenue Manual*, fourth edition. Such improvements are not assessed until the expiry of the subsequent period of settlement; i.e., thirty years at least?—But Government do not spend any money on irrigation here.

26928. We do not assess any improvements caused by irrigation for at least thirty years?—That is the present arrangement, but before that the period was twenty years and before that only ten years.

26929. Thirty years is now the standard, so that a man will not have to pay any extra assessment for thirty years?—That is so, but after thirty years he will have to pay more, and it is because of his labour the land is improved.

26930. But Government is entitled to a percentage of the improvement after thirty years?—Yes.

The Chairman: The minimum period will be thirty years and the maximum fifty-nine.

26931. *Sir Henry Lawrence*: Do you know of cases where zamindars have been deterred from making improvements because of the fear of increased assessment?—Before a settlement people do not take steps to bring the whole land under cultivation, but they do so after the settlement.

26932. *Mr. Hazlett*: On page 184, you mention the fact that the great increase in the price of milk is due to the grazing tax?—It has had something to do with it.

26933. It cannot have had very much. If we assume the price of milk is 4 annas a seer, on that the grazing tax will not amount to more than 2 paise?—But I find the Nepali graziers are not prospering.

26934. They are not prospering because they sell their milk at 1 anna a seer to a man who sells it in the market for 4 annas. It is not on account of the grazing tax, but through bad marketing?—These graziers were prospering when I first came to Gauhati, but they are not now. Those who live within a reasonable distance of Gauhati bring their milk in and sell it direct; they do not deal through middlemen.

26935. The increase in the price of milk is not due to the tax put on by the Government?—The price of other things has risen, but the price

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of buffaloes has not risen, and I think that is due to depression in that trade. I find on inquiry these Nepali graziers are not prospering.

26936. That may be due to the fact they are in debt to the *mahajans*?—They always were. The price of buffaloes ought to have increased considerably, but as a matter of fact it has not done so; it is the same now as it was thirty years ago.

26937. *Sir Henry Lawrence*: What is the grazing tax?—Rs. 3 per year.

26938. *Prof. Gangulee*: From the preamble to your note I find you have devoted a good deal of time and energy to agriculture and horticulture. Can you tell us if your example has inspired others in your district to interest themselves in these subjects?—I think it has done some good in encouraging gardening.

26939. You say you regret very much that on account of advancing age you cannot take an active interest in agriculture. Have you any sons?—Yes, grown-up sons.

26940. Are they interested in agriculture and horticulture? What is their profession?—One is in charge of my rice mill as engineer as well as manager.

26941. So your work will be continued by your sons?—It may be, but I find they do not take as much interest in it as I would like them to take.

26942. Did they have any education in agriculture?—No.

26943. Are you a member of any co-operative society?—No, but I am of the land mortgage bank.

26944. Do you come in contact with the cultivators of your district?—Yes.

26945. You know some of them intimately?—Yes.

26946. Can you tell us if their standard of living has risen during the last ten years?—That is a very difficult question to answer. They certainly smoke more cigarettes than they used to.

26947. Is litigation increasing?—To a certain extent it is, probably.

26948. *Mr. Calvert*: What kind of help do you want to receive from Government for this land mortgage bank?—We require a large amount of money, and, unless Government help us, people will probably be shy of depositing their money in our bank.

26949. You would like a loan to start with?—Yes.

26950. Speaking as a lawyer of eminence and experience, in your opinion are the courts making full use of the Usurious Loans Act?—Unless the amount involved is large, cases of moneylending do not often come into court. In cases where they do come up, the court gives relief.

26951. I thought 80 per cent of all civil cases in India were for amounts of less than Rs. 100?—That is so, but what I mean is that many cases of petty loans with exorbitant interest where relief is necessary do not come into court at all.

26952. Are the courts using this Act?—Yes; in all the courts the pleaders know that when they defend a poor ryot they can have recourse to this Act.

26953. *Sir Henry Lawrence*: What is the ordinary rate at which you hire unskilled labour to-day?—From 8 to 12 annas, I think.

26954. What was it when you began your farming operations?—Much less; not more than 5 annas or so.

26955. *Rai Bahadur R. M. Das*: From your experience as a farmer in this Province, would you say agriculture is followed as a pursuit by young men of the taluk class will pay?—I have gone into that matter very fully in my note. The growing of the staple crops such as the ryots grow will not pay him unless he changes the methods employed. With machinery and scientific agriculture it should be possible to make a decent living.

(The witness withdrew.)

The Commission then adjourned till 4 p.m., on Saturday, the 18th December, 1928, at Jorhat.

·*Mr. Mohendra Mohan Lahiri*]

Saturday, December 18th, 1926.

JORHAT.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE,
K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E.,
C.B.

Sir JAMES MACKENNA, Kt., C.I.E.,
I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Professor N. GANGULEE.

Dr. L. K. HYDER.

Mr. J. HEZLETT, I.C.S.

Rai Bahadur RAMANI MOHAN DAS

Mr. J. A. MADAN, I.C.S.

Mr. F. W. H. SMITH.

(*Co-opted Members*).

(*Joint Secretaries*).

Dr. HALFORD ROSS of the Assam Frontier Tea
Company, Ltd., Talup, Assam.

Replies to the Questionnaire.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) In tea-growing districts, by preventing malaria—(1) by drainage and oiling swamps, and (2) by reclaiming and preventing malaria.

(b) There is shortage of labour in tea-growing districts, Assam; the cause is malaria; coolies are frightened of fever.

(c) I suggest the prevention of malaria in the same way that the Suez and Panama Canal zones have been cleared of it; namely, by draining and oiling so that mosquitoes cannot breed. I am at present engaged in carrying out such measures in a group of tea gardens in Assam, and am willing to tell the Royal Commission how it is done, the cost and the results, which are very promising.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) Yes. By preventing malaria in districts under the sway of agricultural industry. This can be done by the methods now being employed by the tea-growing industries of Assam, in Ceylon, in West Africa, in the rubber-growing industries of the Federated Malay States, in the sugar and rice-growing areas in the United States; and in many other parts of the world. The removal of malaria has been found to be a most important factor in "the promotion of the general well-being and prosperity of rural population." Its prevention increases output by more than a hundredfold.

(b) I suggest more than the conducting of economic surveys. I suggest the actual taking of steps to diminish malaria being undertaken by the Government in conjunction with those agricultural industries where the profits suffice for the collaboration. There is no need to delay in making surveys; the work should be begun.

(c) I was with my brother, Sir Ronald Ross, when he made the well-known discovery of the transmission of malaria by anopheline mosquitoes. Afterwards, I was Health Officer of the Suez Canal zone while that zone was being cleared of fever—there malaria has been entirely abolished. I was subsequently on the teaching staff of the Liverpool School of Tropical Medicine when expeditions for malaria prevention were being organised

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in all parts of the world. And now I am conducting measures against malaria in the tea-growing districts of Assam, being on leave of absence from my post of Medical Officer to the Industries of the City of London, and Medical Member of Council to the Industrial Welfare Society.

Oral Evidence.

26956. *The Chairman:* Dr. Halford Ross, you are at present with the Assam Frontier Tea Company?—Yes, and with another company also; I am with two companies.

26957. I observe from the note you have been good enough to prepare for the Commission that you are willing to tell us what may be done to deal with the problem of malaria. Before doing so, perhaps, you would like to touch on some points not mentioned in your note. Do you desire to make a statement of a general character?—The statement I have here refers entirely to the malaria problem, though not exclusively to that problem in its relation to the tea industry.

26958. I think we would like to hear what you have to tell us on that matter?—There are no special difficulties in preventing malaria and other mosquito-borne fevers in the Upper Assam tea plantations. It is, indeed, easier to accomplish here than in Ceylon or in the Federated Malay States, because of the regular cold weather which occurs in Upper Assam, when the mosquitoes hibernate; this gives us more time to deal with the insect pest, which is the only satisfactory way of getting rid of the disease. Malaria is conveyed from one human being to another only by the anopheline mosquito; it is not carried in any other way. Dengue fever, on the other hand, and some other shorter-term varieties of fever which do a great deal of damage amongst the human population of India and other parts of the tropics are carried by what are known as *Larria* or domestic mosquitoes, which are very prevalent in Upper Assam as well as in other parts of India. Only the female mosquito sucks human blood; the male is a vegetarian. It is a very remarkable thing, but it is only the fertilised female mosquito which sucks blood. The reason seems to be that the extra nutrition obtained by sucking the blood of human beings, monkeys, bats and birds gives the female more strength to generate her young. "The female of the species is more deadly than the male." After the discovery in Calcutta and Secunderabad in 1897 and 1898 of the anopheline mosquito, an attempt was made in the Suez Canal to get rid of malaria by dealing with the breeding-places of the mosquito, and by oiling the surface water, which prevents the mosquito larvae coming to maturity. I was Health Officer there. Malaria was abolished in six weeks, and in one town—Port Said—mosquitoes have not reappeared in the last fifteen years and mosquito nets are no longer required; indeed, they have not been needed at all during that time. All the world knows of the work done by the late General Gorgas in the Panama Canal area, and by others in West Africa, Alabama, Louisiana, Florida, Brazil, the Federated Malay States (by Sir Malcolm Watson) and in various other parts of the world, where malaria has been abolished. In India alone, these measures against malaria have not been taken very seriously; I do not know why, in view of the fact they have been applied so successfully in other countries. Sir Malcolm Watson began measures for two tea companies in Upper Assam three years ago, and I have now come here for two other adjoining companies, so that we are at last making a beginning, although a belated one, in India, to prevent this disease. In upper Assam, the chief breeding-places of the mosquitoes are the swamps which surround and intersect the various tea estates; in bamboo stumps which form cups in the palisades, which cups get filled with water and are a fruitful cause of mosquito-borne, in India to prevent this disease. In Upper Assam, the chief breeding-places and jugs lying neglected in compounds in lines, and in huti houses occupied by coolies. The method of dealing with the breeding places are as follows. In the first place, it is necessary to drain the swamps near tea garden bungalows, coolies' lines, and (where possible) huti communities. These last, being in outlying parts, are sometimes rather difficult to reach, especially in the rains. Each swamp should have a central drain, or, if there is already an existing central stream, this should be straightened, deepened and widened. It is very important to remember that in most of these swamps in Upper Assam, and in most of those I have seen in other parts of India, the central stream ambles along

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in S-shaped curves. The important thing is to canalise it. It can be done very cheaply, because up here the earth in the swamp is very soft and there is no rock or stone. In addition to the central drain, we build contour drains round each side of the swamp, following the edge on both sides. These are shallow drains 5 feet wide at the top and 2 feet 6 inches deep. It is important that they should not be more than a foot wide at the base or bottom of the drain. These contour drains are connected with the central stream at intervals, and in this way the swamp becomes slowly quite dry in the centre, and the water is drained into the central stream instead of lying in the marshland, so that we can oil the water and keep it under control, the whole object of the process being to have what we call "water-tidiness" instead of swamps. By means of these drains, moreover, the flood water is got away from the neighbourhood much more rapidly, and the contour drains intercept any seepage there may be from the higher banks which are under cultivation. The cost of this drainage varies, but it has not yet exceeded Rs. 12 per acre of the area of cultivation. Usually it is very much less than that. The cost of it should be met from capital account, for it is a permanent and final cost.

Secondly, there is maintenance. This consists of two gangs of coolies in each division of the estates to be dealt with, such divisions not exceeding 1,000 acres. These two gangs are under the control of foremen and each consists of three men. One gang of three men, with the foreman, keeps the drains in good order and repair, grades them regularly and sees that the water does not stagnate in them. This gang is occupied during the rains (when it cannot work in the marshes) in cutting bamboo stumps off through the top notch, in order to prevent them retaining water in which the mosquitoes can breed. The other gang, under another foreman, is given a 40-gallon cask containing mixed equal parts of crude petroleum and the cheapest obtainable kerosene. This 40-gallon cask is on wheels (I generally use old buggy wheels) and it visits every part of the area; it visits each swamp, all the coolie lines, and the compounds of every house and bungalow at the same hour of the same day every week in the year, oiling all collections of stagnant water, and upsetting all tubs, barrels, jugs, etc., which could harbour mosquitoes or enable them to breed. It is most important that the work of this gang should be done regularly once a week. Those swamps which for any reason cannot be drained should be treated with Paris green once a week. This is a compound of arsenic which should be mixed with dry road dust in the proportion of one part of Paris green to fifty of dust (by weight) and it is wafted over the swamp; it is thrown up into the air by the handful over the swamp from the edge, so that the wind shall take it and allow it to settle on the swamp. It is quite harmless to all life except the anophelino mosquitoes which feed on the surface of the water, or just below the surface. Unfortunately its action is uncertain, because it depends on the vagaries of the wind, and therefore it cannot be relied on and must only be used as an adjunct; it cannot replace draining and oiling. We have found the maintenance costs come to Rs. 1-8-0 per acre of cultivation per year, which is not a very large sum. You have therefore two expenses; the initial, permanent, final cost of the drainage and the small charge for annual maintenance. There is one thing which is essential for the success of this work: it requires the keenest enthusiasm of all concerned. If managers and assistants and others connected with the industry become apathetic, all the good work that has been done in the past will be undone, and the work will fail according to the degree of the apathy displayed. If, on the other hand, the work is always conducted with keenness, it will result in immensely improved health in the industry concerned (whatever it may be) and will lead to a great increase of efficiency and to greater production and greater happiness on the part of the workpeople employed.

26959. Have you long experience of India?—I have been here three times. This time I arrived only last April.

26960. How far do you think a scheme of the type you have outlined would be applicable to a typical rural area?—Success would vary according to the amount done. Mosquitoes do not fly far; the average flight of a mosquito is rarely more than half a mile, and she will not fly even that distance if she can find plenty of food and water without going so far. If, therefore, anyone living in a rural area chose to undertake the clearing of his own and his friends' houses within half a mile, it would be of great benefit to them.

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26961. *Mr. Colvert*: How far can they be blown?—We found by experiment and observation in the Suez Canal area that the utmost limit was less than a mile. Some people have said that with a gentle following wind a mosquito may go a mile and a half, but a mosquito is a very delicate creature and a strong puff of wind may kill it. A mosquito always prefers a still night.

26962. *The Chairman*: Under the conditions in which you are now carrying on your campaign, you have, of course, the organisation of the tea planters behind you?—Yes.

26963. How would you go about it if you were asked to apply these more or less complicated and not inexpensive expedients to an ordinary rural area?—It can only be done by getting people to combine, each subscribing a little. It has been done over and over again.

26964. Where?—In Egypt, for example; in Cairo. The inhabitants of Kasr-el-Dahara, which is the official district of Cairo, all subscribed and put the work in the hands of one man who was rather keen. It only cost them a few shillings per head, and this individual got his gangs together and his oil barrel and has been quite successful.

26965. *Prof. Gangulee*: It was a purely non-official body?—Yes.

26966. *The Chairman*: Those were urban people of the well-to-do class, were not they?—Yes. But there have been a good many crusades carried out in South America by people who are not at all well-to-do, but who have been under the necessity of doing something, because there they have the mosquitoes which carry yellow fever.

26967. The main object of the Panama Canal campaign was to stamp out yellow fever, I believe?—No, I think malaria was the chief cause of the trouble there.

26968. How wide is the belt that has been cleared?—The canal is fifty miles long, and I think the belt is five miles broad.

26969. Beyond that belt, are the diseases as bad as ever?—Yes.

26970. So it is the economic opportunity afforded by the canal which has enabled this important work to be carried out?—Yes. De Lesseps failed on account of malaria, you will remember, and the canal could not be carried through until it was stamped out.

26971. *Prof. Gangulee*: Who financed the anti-malaria work in the Panama Canal zone?—The American Government.

26972. *Dr. Hilder*: How many years did they give to the campaign in Panama?—General Gorgas did the whole thing in two years, I think; but of course they still have to do the maintenance work, just as I have described it here. That must go on for ever. If the maintenance gangs cease work, the mosquitoes will soon come back.

26973. *The Chairman*: And will malaria return?—Yes.

26974. Where from?—The infection comes in through immigration.

26975. You have always got the carrier ready to infect the mosquito?—Yes. You cannot exterminate an insect completely; you can only reduce it to a negligible quantity.

26976. But I can conceive a situation arising after a certain number of years when no malaria would be present in any human being, as in England?—Yes, but as world communications improve, there will always be a liability for it to be introduced.

26977. On page 189 of your note, you refer to economic surveys in connection with anti-malaria work. Do you think these economic surveys might be a sound foundation on which to proceed?—No. I, and many others, have been asked over and over again to make a survey for this work, and we go and make a survey, and there the matter ends. We are always making surveys. The other day I went to a large tea estate, where I found pigeon-holed no less than five surveys.

26978. And not a single one had ever killed a mosquito?—No; no attempt had been made to carry them out. The matter got as far as the survey, and that was the end of it.

26979. *Prof. Gangulee*: Did you derive any useful information from those surveys?—It was interesting to examine them, because there were slight differences of opinion between the five gentlemen who made the

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surveys, but it was rather heart-breaking. The estate had spent a good deal of money on having those surveys made, and there the matter had ended.

26980. *The Chairman*: Are you familiar with the health organisation of the Central and Provincial Governments in India?—I have not gone into it very carefully, because I do not have much to do with Government here.

26981. You would not wish to say anything about the presence or absence of sufficient organisation to deal with this problem?—From what I have seen in Assam, the organisation is sufficient to deal with it in certain industrial districts, but I doubt if the Government organisation would be big enough at present to deal with it over the country as a whole. I certainly think, however, a great deal could be done in industrial districts.

26982. Would you associate wet paddy land with the growth of the anopheline mosquito?—Hardly at all. If you remove the swamps, I do not think paddy land will account for much malaria.

26983. *Mr. Calvert*: Why not?—Before the rice is sown, in most of these paddy fields there is a water bug which eats the mosquito larvæ. This bug cannot operate after the rice is sown, because the stalks grow up quickly and interfere with it. I find, however, that in the majority of paddy fields there is no necessity to keep the land everlastingly sodden. The rice has to be planted in water, but the natural rainfall is usually enough, and if there is any chance of getting the extra water off the rice land, the rice will be all the better for it and the mosquitoes all the worse. I do not associate paddy land, by itself, with the causation of much malaria; it is the swamps and marshes that cause the trouble.

26984. *The Chairman*: Speaking of the conditions under which you are working at this moment (those of the average tea plantation in this Province), do you think it would be possible to control malaria in the tea plantations as it has been controlled, say, in the Panama belt?—Yes, I am convinced of it. I am convinced that if an organisation like the Indian Tea Association were to undertake the malaria problem thoroughly, the disease could be almost abolished in the tea industry, so far as Assam is concerned. I have not vast experience of the parts round Sylhet; I saw them in the rains, and that is all. So far as this district is concerned, however, I am convinced we could limit malaria to a negligible amount; we could practically eliminate it. If people will only get together, it can be done.

26985. *Dr. Hyder*: What measures would you recommend for Bengal? Bengal is one big swamp?—I do not know Bengal very well. I know Calcutta, and I have passed through Bengal in a train in the rains. I am convinced a great deal could be done there. Remember, no matter how little you do, every little counts. If you reduce your mosquitoes by 25 per cent, you reduce your malaria by 75 per cent because the malaria-mosquito ratio is geometrical and not arithmetical progression. Every little that is done helps, and will produce beneficial results so long as it is persevered in. A great deal could be done, I am convinced, in the iron ore obtaining districts in Bengal.

26986. *The Chairman*: Do you know what is being done in the coal-mining districts?—They have sometimes asked me to advise them, but I have not heard definitely. At Asansol, there is a Health Board which is very keen on the work, but what has actually been done in the way of the prevention of malaria by these methods I do not know.

26987. *Mr. Hezlett*: With regard to cost, do you mean the first cost is Rs. 12 per acre of tea or per acre of swamp?—Per acre of tea.

26988. The maintenance costs also are per acre of tea?—Yes.

26989. Per acre of tea under cultivation?—Yes.

26990. *Prof. Gangulee*: Is the scheme you have outlined already working in Assam?—Yes, on six estates.

26991. Six different centres?—Yes.

26992. For how long has it been working?—Sir Malcolm Watson began it three years ago in one district; Dr. Bennett began it eighteen months ago in another, and I started here last April.

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26993. Have you anything to say with regard to the result of these experiments?—Yes. There is a very considerable reduction of malaria in one of the companies; the other companies have not been going long enough to get figures. Malaria is a very slow-going disease.

26994. What is the method of applying kerosene oil?—The female mosquito lays her eggs on the surface of stagnant water, also of running water but not very fast running water. It lays 150 eggs and out of each egg comes a little larva which lives for 12 days in the water; the larva breathes either through its back or through its tail; it puts the tail up through the water and breathes from the surface and if you cover the surface with oil, it dies. The oil should be on the water for half an hour at least and it should be applied once a week to be within the safety limit.

26995. You made a reference to the work done by the rubber-growing areas in the Federated Malay States; was it Dr. Watson's work?—Yes, Sir Malcolm Watson.

26996. Are the conditions prevailing in Assam the same?—No; the conditions prevailing in Assam are very much better because we have a cold weather here and they have not.

26997. Do you consider irrigation responsible for the prevalence of malaria?—Irrigation, if badly controlled, would give rise to malaria; but irrigation if properly controlled would prevent malaria.

26998. What do you actually mean by saying 'badly controlled'?—The ancient Egyptians used irrigation that was the cause of malaria and it is believed that malaria wiped out the whole race; that was when water was allowed to overflow and form swamps. But in Modern Egypt with no Nile water running into the sea and all being used for irrigation, there is no malaria because the water is kept in proper bounds and does not form swamps at all.

26999. Would you say that the embankments as they exist in the deltaic tracts of Bengal and in some other parts of India, for instance in the Godavari delta, are badly controlled?—I am afraid I have not seen them.

27000. Or as they exist near Burdwan?—No; I have not seen them. But does the water flow over the embankments?

27001. No, not always?—Then it ought not to be malarious.

27002. Sometimes it over-flows the embankments and sometimes it does not. Do you associate embankments with malaria?—Not embankments by themselves; if the embankment is bad and it allows the water to flow loosely all over the place, then you are bound to get malaria.

27003. Mr. Culvert: Were you quite fair to the authorities in India when you said that measures had not been taken seriously here? Was not there a Malaria Commission?—But so far as I know, nothing serious has been done.

27004. Was not a serious attempt made in this direction and an experiment also tried in Lahore Cantonment?—Yes, and it failed; and we always believed that that experiment was never done properly and that it was a failure because there was a great amount of lethargy shown.

27005. Sir Walter Kitchener was in charge?—I do not remember; but India was always lagging behind in these matters when compared to other countries throughout the world.

27006. They are all practically small areas?—There are big areas too. What about Brazil? They have been working there for ten years and they have got rid of much malaria. All the malarious areas in the whole of the United States have all been dealt with. I think I was perfectly justified in that remark. India has been very much behindhand in these matters considering the amount of malaria it has.

27007. You say the cost amounts to Rs. 1-8-0 per acre cultivated. That is about the equivalent of land revenue. You propose an experiment which involves an expenditure equal to the land revenue?—In an industry like tea; that is what it has cost us on a tea estate.

27008. That is only in Assam. Do you think it would be less under average conditions?—Yes; but in any case whatever the cost it would be worth while incurring it, if we are going to improve the health of the population.

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27009. But it is a recurring charge?—Even so you have to pay. England is the healthiest country in the world, but look at the taxation it has.

27010. You doubt the burden on the land?—That may be, but it is worth if you are going to get a healthy population instead of a diseased one.

27011. Even at a financial sacrifice?—Yes.

27012. I gather that you get better results in the case of an island?—It depends how big the island is; a very small island, as big as this compound will not do. But remember this, that if you had it on a very small area you would find it very difficult to get results in figures; it is much better to take bigger areas and get people to combine and undertake it on a large scale rather than a small one, and it is much cheaper too.

27013. You mention that a decrease in the number of mosquitoes led to a still greater decrease in malaria; but the converse does not hold good, that an increase in the number of mosquitoes will lead to increase of malaria?—Yes; it does, if proper safeguards are not taken.

27014. There was an enquiry in the Punjab which showed that mortality from fevers bears no relation to the number of mosquitoes?—Yes; I said the amount of fever would increase; I was not referring to the death rate. The more mosquitoes there are, the more fever you get; but the death rate depends on a good many factors. You have got a certain amount of immunity, especially in grown-up people, which varies in different districts and in different individuals. Immunity is a very big question and the death rate does not depend entirely on the fever. And, as I said just now, the incidence of malaria must vary directly with the numbers of the infected insects.

27015. You talked about the officials not taking things seriously; but, taking a Province with 20 million acres, it is the amount of money, the cost required, that has to be taken into consideration; it is not lethargy but a question of practical difficulties?—Yes; but you have to attempt it and you will succeed.

27016. It failed in the particular case?—That is the only one case which really occurred in the whole world. We think that is all out of date. We know it has been successful in other parts of the world and it is high time to do it in India. Remember you are losing in India more than a million people every year from malaria.

27017. If you are so certain that this could be carried out successfully, to what do you ascribe what you call the lethargy of the military medical officers?—I really do not know. That discovery was made quarter of a century ago.

27018. *Prof. Gangulce*: How do you explain the apathy of the people who suffer?—That is due to ignorance. So far as India is concerned, a lot of it is due to ignorance on the part of the people. It is a country with very little primary education, and if there is primary education I do not think they are taught much about cleanliness and sanitation; it is a most insanitary country.

27019. *Rai Bahadur R. M. Das*: Is it a fact that the mosquito breeds in small holes, ditches and ponds in private compounds?—Yes.

27020. Is it not, therefore, necessary that the compound of every householder should be attended to and treated before the big projects you speak of, involving heavy outlay, are undertaken?—I think it is very sound; but the problem is not entirely in the compounds of private houses.

27021. Then how do you propose to have this done?—In the way I have described gangs of men going round and draining away all the stagnant water, or oiling, as the case may be.

27022. In private compounds?—Yes; not inside the houses. There is nothing inside the houses.

27023. I am speaking of the compound. Within the compound there are holes, ditches and other places where, as you say, the mosquito breeds. How are you going to deal with these breeding places?—They should either be filled up or oil should be applied once a week.

27024. Who is going to put the oil in?—I have already said we must get the people to combine; it requires organisation, but I am sure it is most valuable.

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27025. Unless people realise the importance of it, do you think it is possible?—But surely the people must realise the importance of it now after quarter of a century; it is a long time.

27026. And who is going to pay for this expenditure?—You mean in general agriculture?

27027. There are people in various occupations?—That ultimately must come round to the Government, until the people are educated. To-day I think Government could do a great deal.

27028. So it should be done by the Government?—Not all; Government cannot do it all alone. As I said in the penultimate paragraph of my remarks, you must have keenness on the part of all concerned; and, what I do consider as most important so far as health is concerned, there ought to be a great deal of health education and propaganda going on in this country.

27029. Propaganda work is necessary?—Yes, absolutely necessary.

27030. *Sir Henry Laurence*: What powers did the Sanitary Officers have in Port Said to enforce sanitation on the people?—I was the Sanitary Officer and I had no powers at all. So far as Egyptians were concerned, they were under the Egyptian Government and Government could not enforce a good deal of its own laws. But Port Said was a town of 50,000 people, where there were more than 15,000 Europeans belonging to most of the large nations of Europe; each of those nations was represented by a Consul and the Europeans were under those Consuls. I had the greatest difficulty with some of these Europeans firstly, in getting them to allow our mosquito gangs into their houses. They thought that I was trying to abrogate their privileges till I explained things to them; I talked to them; I implored them and eventually they gave way and we were successful. I was careful in choosing my men, made sure of not having thieves among them; and ultimately the whole thing went through; there has not been a mosquito-net now in the town for the last fifteen years.

27031. And no regulations were imposed on the people?—No; all was done by persuasion.

27032. You spoke of some powers of the Egyptian Government?—The Egyptian Government had legal powers to allow the officer, that is, myself, to enter the houses, but I had no powers to go inside the houses or the compounds of the Europeans.

27033. That is as regards the Egyptian population?—The Egyptian population was comparatively easy. I had the power behind me, but they never raised the slightest objection. The objections wherever they were raised were from the European Consuls.

27034. *Sir Thomas Middleton*: How would you deal with such large sheets of water as village tanks?—By clearing the sides of vegetation. Mosquitoes will not breed in the middle of the tanks, but they will breed in the vegetation round the edge if you allow the vegetation to grow.

27035. So that it will not be necessary to oil a tank?—No; but you must oil round the edge; just a spray of oil round the edge would be sufficient.

27036. *The Chairman*: It is important to allow the sun to reach the surface of the water?—Yes; sunlight on the surface of the water will keep mosquitoes from breeding.

27037. So that overhanging trees ought to be removed?—Yes; that is most important. Still more important is the removing of vegetation growing round the waters' edge.

(The witness withdrew.)

Rai Sahib NĀRAYAN BARUA, Honorary Correspondent, Agricultural Department, Assam.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—Research work in Assam is practically poor, there are no officers nor proper facilities. Up to this time except a little work in paddy and sugarcane, no other important crops such as mustard, cotton, etc., are yet taken up. No attempts practically have been made in ascertaining the usefulness or necessity of superior types of plough, etc.

Similarly no research work has been taken up on the usefulness of indigenous drugs and methods of treatment of cattle nor on the improvement of cattle.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) Certainly there is. Village schoolmasters who are trained in the art of teaching in the normal schools at Jorhat and Silchar should have a sort of both theoretical and practical agricultural training along with their course so that when they come to village schools, they may make use of their agricultural knowledge in training little boys in the simple methods in order to give them a love of agriculture from their tender age.

In the secondary schools, an additional class for agriculture should be opened in charge of a teacher who is properly qualified in agriculture.

Similarly in the arts college there should be a higher class for agriculture in charge of qualified teachers.

(ii) Naturally it should be desirable to draw teachers from agricultural classes in rural schools in rural areas.

(iv) At present, there are no agricultural institutions in the Province where students may be trained in agriculture except in some Government farms where demonstrators are trained for only public service. There has been no demand so far for agricultural training by youths.

(v) If it could be practically demonstrated that agricultural farming pays as much as that it fetches a net income of Rs. 1,000 a year and if proper facilities for training, acquiring land and capital expenses and all other necessary help from the proper direction be given, there is no reason why there should be no youths forthcoming for taking up agriculture as their profession.

(vi) Not generally.

(vii) Does not arise.

(viii) These should be maintained but, unless the teachers are well trained, it is all the same whether these exist or not.

(ix) Public service in the Agricultural Department.

(x) As shown in (v) above.

(xi) Not at all but it is extremely necessary to improve and refresh their knowledge.

(xii) By practical demonstration, evening classes and lantern lectures by itinerating parties.

(xiii) (a) Village authorities in co-operation with the Agricultural, Veterinary and Co-operative Departments.

(b) Local Boards, local funds and contributions from Government departments.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) By practical demonstrations, agricultural shows, lantern lectures and by publication of periodicals, leaflets, etc.

More honorary correspondents should be appointed in suitable centres and full facilities should be given them for carrying out demonstrations and propaganda work.

(b) Demonstrations should be held actually on the ryots' holdings. As soon as the result of demonstration is noticeable, neighbours should be collected together and the effects explained to them. Photographs of

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such demonstrations and of harvests should be taken and lantern slides should be made of them. Then a public meeting should be organised where lantern lectures explaining the nature and result of demonstrations should be given, and also handbills describing the above facts should be distributed.

As far as possible, local small agricultural shows should be organised in the two seasons of the year.

The above steps are bound to attract attention of some cultivators. When this is so, seed, manures, implements, etc., as the case may be, should be supplied free or at concession rates. Then the demand for undertaking demonstrations may increase and effectiveness of demonstrations may go ahead. Money should not be grudged at this stage.

(c) Success of demonstrations and sympathy and good nature of the demonstrators and the superior officers who should be sons of the soil as far as practicable and who are in touch with the ryots go a great way to induce cultivators to adopt expert advice.

(d) So far as I know, much success has been achieved in the popularisation of superior varieties of sugarcane and potatoes and of three-roller iron mills and *gur* boiling iron pans.

Success to a degree has also been obtained from *Indrasail*, *Georgesail* and *latasail* and *katakura aus*.

Manure demonstrations such as bonemeal, oil-cake, etc., in paddy and sugarcane, although proved successful, have so far failed to induce cultivators to adopt them on account of high prices of bonemeal and oil-cake.

For want of reliable seed, sometimes the demonstrations fail.

QUESTION 4.—ADMINISTRATION.—(b) The Head of the department should be an expert. He should have a general broad outlook and be a man of varied experience. Heads should not be selected from any specialised branch of agriculture.

(c) (i) Not fully. The services are handicapped for want of men. The Provincial Agricultural Service may be extended and a Provincial Veterinary Service may be organised. The number of Agricultural Demonstrators should be increased and an intermediate service between the Agricultural Inspectors and Agricultural Demonstrators should be organised. In the Veterinary, an intermediate service between the Superintendent and Inspector which may be styled as Provincial Veterinary Service may be organised.

The pay and prospects of Agricultural Inspectors and Veterinary Assistants should be improved.

The members of the Imperial Agricultural Service may be appointed for research work in the different branches of agriculture.

(ii) Yes, generally with the system. But rates of freight should be more uniform and agricultural produce, seeds, manures and implements, etc., should be given concession freights and borne with more care and in special vans whenever necessary.

(iii) Yes, more or less but more cartable feeder roads with permanent bridges and culverts are necessary.

(iv) A branch of the Meteorological Department may be established with advantage and research work should be undertaken with the old system of forecasting.

(v) Post and telegraph offices may be increased. Some concession in fees may be given for parcels of agricultural seeds, etc.

QUESTION 5.—FINANCE.—(a) The present system of granting loans to cultivators is not very encouraging. The fund that is now at the District Officers' disposal is too small and not far-reaching. The fund may be divided between the District Officers and the Director of the Department. Small short-term loans such as for purchase of seeds, cattle, etc., may be disposed of by the District Officers and bigger long-term loans required for special purposes and agricultural improvements may rest with the Director of the Agricultural Department.

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(b) The amount of the agricultural loan as is the custom at present is not sufficient and at the same time is not easily available. The present process of supplying and securing a loan is rather tedious and sometimes vexatious. If improvement could be effected in the system, probably the cultivators will be more induced to take advantage of more loans.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) Failure of crops due to season, flood, insect pests, etc., wild animals, failure of health, cattle mortality, want of good seeds, joint family system and generally want of education.

(ii) Village moneylenders, Marwaris and co-operative credit societies to some extent.

(iii) Heavy interest, and also for causes as given in (i) above.

(b) There should be a net-work of co-operative credit and agricultural purchase and sale societies all over the Province and the Town Banks and Central Banks should be better financed.

(c) Yes, such measures are necessary.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) Consolidation of holdings as introduced in the Punjab may be tried. Village authorities may also take some lead in the matter.

(b) Personal jealousy, animosity, and self-interestedness. This may be overcome by persuasion and better education.

(c) Yes.

QUESTION 8.—IRRIGATION.—No systematic measures for irrigation have ever been taken in the Province although there are necessities in every district. There are innumerable sources of water-supply such as rivers, streams, tanks, but no advantage has ever been properly taken. Force pumps, chain pumps, bucket pumps, etc., may be tried and introduced whenever possible. A system of irrigation by bunding may be tried where possible.

Want of proper initiative.

QUESTION 9.—SOILS.—(a) These are more or less local matters to be dealt with under local conditions.

(b) (i) Such improvements may be found generally in tea gardens, and partially round about village-sites.

(ii) Most of the *rupit* lands have undergone deterioration.

(c) Government should arrange a survey of such areas of cultivable land which have gone out of cultivation and take every possible measure to investigate and find out ways, on scientific and practical lines, for improving such lands and then by demonstration of such methods the areas may be improved. The methods should be inexpensive at the same time.

QUESTION 10.—FERTILISERS.—(a) Both. Proper measures have not yet been taken.

(c) First experiment and then demonstration, then propaganda.

(d) Except in tea-gardens not known in cultivators' land.

(e) Not yet.

(f) Use very rare in this Province.

QUESTION 11.—CROPS.—(a) (i) Some improvement has been made in sugarcane but not so much in potatoes, paddy and jute.

(ii) Many useful crops, such as pulses, *lhesari*, *masuri*, peas, gram, etc., oil-seeds such as linseed, ground-nut; wheat, barley, coffee, arrowroot, *sati*, cassava and some medicinal and perfumery plants and fodder grasses such as Guinea grass, Job's tears, etc., are to be introduced.

(iii) Better seeds should be produced and better system of distribution also should be introduced.

(iv) By granting more licences for guns, and introduction of effective traps.

(b) No.

(c) Sugarcane, paddy, jute, potatoes, etc.

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QUESTION 12.—CULTIVATION.—(i) First improve the cattle of the cultivator then try to introduce better ploughs and other implements.

(ii) The present system of rotation of crops is quite all right but mixtures of crops such as *masuri* in mustard, *khesari* in paddy, etc., is recommended.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(i) The present measures, I think, are sufficient.

QUESTION 14.—IMPLEMENTS.—(a) Some improvement in the existing implements and introduction of time and labour-saving implements such as seed-drills, hand hoes, hand-ploughs, weeders and gardening tools, and water-lifts, etc., is necessary.

(b) They should be cheap and easily available and easily repairable.

(c) Manufacturers should arrange to establish sale depôts in suitable centres and also keep trained mechanics for quick repairing and also arrange to distribute such implements on easy-term instalment system in co-operation with the Agricultural and Co-operative Departments.

QUESTION 15.—VETERINARY.—(a) Preferably under the Director of Agriculture, so far as present circumstances are concerned.

(b) (i) Yes; not satisfactorily as Boards do not keep sufficient number of them and do not provide with sufficient medicine.

(ii) Not satisfactorily.

(iii) Yes.

(c) (i) Yes, but these are very few and sufficient help is not found.

(ii) Yes, practically there are no touring dispensaries and if there be one or two here and there these are not well organised and not sufficiently stocked with medicines.

Touring dispensaries should be distinct from stationary dispensaries—one Veterinary Assistant in charge of a dispensary should be always on the move and he must have plenty of medicine in stock and must be able to halt at suitable centres for longer periods and he should also take notes of special cases of ailments to report to his superior authorities.

(d) Conservatism, prejudice and superstition generally stand in the way.

Not in the literal sense but certain instruments for giving occasional frightenings to the cultivators of uncompromising attitude may be found useful.

(e) Yes, there is some difficulty in getting timely and sufficient supply of serum in times of epidemics as in the present year.

(f) As stated in (d) above. No fee is charged.

(g) Yes.

(i) & (ii) Whether the Research Institute be extended at Muktesar or there be one in the Province, I think, does not matter; the only thing wanted is more and timely supply of serum.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) By providing a good number of breeding bulls and sufficient grazing grounds throughout the Province.

(ii) Practically there is nothing of that sort. Whatever there is it is in the hands of the illiterate Nepali and Deshwali Khutiwallas in the crude state. There is ample field for improvement by education.

(iii) Practical methods of better handling of livestock, housing, feeding, milking, etc., should be introduced by demonstration.

(b) (i) The common pastures are few and far between and greater parts of them are practically of no use as some of them lie in the out-of-the-way places; some of them are deep jungles and some of them are low lands with *kurkanis*. Besides, there is no facility for drinking water in such grazing grounds.

(ii) Enclosed pastures are generally absent.

(iii) Generally not insufficient in respect of straw.

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(iv) Generally insufficient in the dry season.

(v) Not investigated.

(e) From 1st October to middle of November. Last three weeks of November. About six weeks.

(d) By the introduction of the cultivation of fodder grasses such as Guinea grass, Elephant grass and Job's tears and any other suitable grass.

(e) By persuasion and education and by practical demonstration.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) An average cultivator spends about 150 to 200 days in his agricultural operations; about fifty days are occupied in sickness; observing social and religious ceremonies, occupies fifty to sixty days in either holiday-making and idling and the rest he spends in collecting fuels, materials for house-building and repairing, etc.

(b) (1) Assam is rich in raw materials; if Government established any match factory or paper mills or if such industries be established by private agencies, then cultivators may supply sticks or pulps as may be required by the factory.

(2) Spinning and weaving of cotton and silk should be more widely encouraged. Weaving of jute for gunnies and hessians may be introduced.

(3) Cane and bamboo work and *sital pati*, grass mats, etc.; pottery and tile-manufacturing should be more encouraged and more facilities for collection and disposal may be found by the State.

(4) There is ample scope for establishing workshops, for manufacturing useful agricultural implements such as ploughs, *bidhas*, scythes, etc.

(5) There seem to be chances for canning industry, soap manufacture, cigar and cigarette manufacturing, etc.

(c) Caste system, ignorance and want of proper facilities and technical knowledge. At any rate, regular steps may be taken for popularising these important industries.

(d) Most certainly.

(e) Not necessarily but on the other hand this should not be encouraged.

(f) Most certainly.

(g) Let there be more organised village organisations and authorities to learn more self-help and mutual helpfulness.

(h) The above agency will go a great way to help the people in looking after their sanitation. Education and practical demonstrations on the various aspects of sanitation, etc., may be given more widely.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) Practically there is no surplus of agricultural labour; if there be any anywhere this may be drawn to—

(i) by offering higher wages, more comforts and more brotherly treatment and by giving allowance for caste prejudices and allowing share-system of cultivation, commission system of remuneration, if necessary;

(ii) by encouraging "Pam" system by giving all necessary Government help for the protection of their own lives and crops and cattle.

(b) Contentment due to low-standard of living and comforts, sense of self-respect, low birth-rate, excessive drug habits, are some of the main causes of shortage of labour. Time and education are its healers.

(c) Migration may be considered.

QUESTION 19.—FORESTS.—(a) I suppose to some extent grazing facilities are limited and also so far as I know availability of suitable wood from forests for purposes of ploughs, etc., is becoming more and more restricted. More facilities under proper regulation may be given.

(b) There are grazing grounds in some rural areas but these are devoid of any trees and there are some which are under shrub jungles. Attempts may be made through forest regulation for afforestation. There are also uncultivated shrub jungles under patnas. Encouragement may be

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given to the patta holders for afforestation, if proper concessions be given in land revenue. This procedure will help matters in the supply of ploughs, etc., as stated above in (a).

(c) Yes, to some extent. As deterioration goes on in the forests, improvement in the leading *khals* and channels should go on simultaneously.

(d) By the planting of shade trees such as *Siris* and *Medeloa*, etc., in vacant lands.

(e) Yes, to some extent.

QUESTION 20.—MARKETING.—The existing market facilities are more or less satisfactory; matters may improve gradually with the opening of more feeder roads and railways.

The Province goes probably without a Chamber of Commerce and Agriculture; if there be any it is hardly known to the people.

There is a lack of *aratdari* system of disposing of surplus produce amongst the Assamese; with commercial education this may take a turn.

There are no purchase and sale societies governed by the co-operative principle. This may be encouraged.

Most of the valuable produces such as paddy, mustard, gum, lac, are disposed of through middlemen who for the greater part are foreigners.

Village moneylenders and *mahajans* feed upon the fat of the producer whereas the producer himself gets only a fraction of the actual profit.

Consumers often have to pay three to four times the actual value of the produce that the producer gets.

Barter system is greatly in vogue in the Province and this system has its own baneful effects as well as its benefits. Generally the producers are illiterate and they are deceived in weight or prices or exchange.

Such are the drawbacks in the disposal of agricultural produce. Irreligion and want of education are at the root of all evils. Education, co-operation, village organisations and agricultural associations may be of immense benefit to the cultivator.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—Small custom duties on imports of food and clothing materials and high duties on such exports do adversely affect the prosperity of the Indian cultivator.

QUESTION 22.—CO-OPERATION.—(a) (i) & (ii) By co-operation between Government and non-official agencies themselves and then by propaganda work.

(b) (i) to (ix) Except credit societies, a few of which exist here and there, people have no idea of the other forms of societies. But all the same these are very useful and attempts should be made gradually for their forming.

(c) Yes, legislation may be found useful in compelling the minority to join for the common benefit of all.

(d) Only to some extent. The defect mainly lies in the slack supervision of such societies.

QUESTION 23.—GENERAL EDUCATION.—(a) The present system of education, both higher and middle, practically has no bearing upon agriculture and much less on agricultural efficiency. There may be some nature study lessons in the primary schools but these are practically of no avail as the teachers are not themselves well trained in the art, the teachers doing only the routine work.

(b) (i) Organisation of rural societies for the improvement of rural education should be taken up everywhere. Evening classes and propaganda work both for males and females will add much help in the efforts.

(ii) Compulsory education in rural areas is very necessary.

(iii) Because they are recalled to help their parents in their occupation and also the present hours of school and the distances of such schools from each other and, not the least, the expensive nature of education, are equally responsible.

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QUESTION 24.—ATTRACTING CAPITAL.—(a) Limit further extension of tea cultivation and much of the capital will be relieved. Let the tea concerns set apart a portion of their grants for agricultural farming on scientific lines and prove successful and these examples may be followed by enterprising capitals. First of all it should be the duty of the Government to start demonstration farms all over the country run on scientific lines and yielding good income and there is no reason why capitalists should not change their angle of vision. Poultry-farming, sheep and goat-rearing, cattle-breeding, dairy-farming, fruit-growing, arrowroot-manufacturing, etc., all these are worthy of trial.

(b) Sheer ignorance and fear of higher assessment of land revenue.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(c) Yes, I made a joint enquiry on the above lines with a Government official and my conclusion is that almost every year, every family falls in deficit.

QUESTION 26.—STATISTICS.—Unless there be a separate department for statistics for the Province, I am afraid, matters will not improve.

Oral Evidence.

27038. *The Chairman* : Rai Sahib Narayan Barua, you are an honorary correspondent of the Agricultural Department in the Province of Assam?—Yes.

27039. You have been good enough to provide the Royal Commission with a very interesting note and we are much obliged for the trouble you have taken in preparing the same. I understand that it will be to your convenience to speak to the Commission through an interpreter; is that so?—Yes.

27040. I turn to the note that you have prepared for the Commission. On page 197, in answer to our Question 2 (v), you say that if it could be practically demonstrated that agricultural farming pays as much as that it fetches a net income of Rs. 1,000 a year, it would be more attractive. Does the net return not necessarily depend upon the capital invested?—Yes; that should be the income after all the expenses are deducted.

27041. The note is so complete that I have very few questions to ask. There are just one or two points which I wish to have elucidated. On page 198 you point out that one of the difficulties in inducing the cultivators to adopt the use of bonemeal and oil-cake is the high prices. Is it your view that at the present prices the use of these fertilisers does not pay?—The prices of fertilisers have gone up.

27042. And they no longer pay; that is your view?—Yes.

27043. Is the problem of fragmentation of holdings a serious one in the districts with which you are most familiar?—Yes; legislation is necessary.

27044. Are you familiar with the districts in which the practice of *ghuming* cultivation or shifting cultivation is in use?—No; I am not familiar with it.

27045. What districts are you thinking of, when you suggest that there is a certain opening for minor irrigation schemes. You say on page 199 in reply to Question 8, Irrigation, "No systematic measures for irrigation have ever been taken in the Province although there are necessities in every district"?—Use could be made of the existing rivers and brooks.

27046. Lift irrigation from existing rivers, is that your idea?—Yes; embankments are necessary; that is most important.

27047. So as to hold up the water in small streams and utilise it in the neighbouring lands; is that the idea?—Yes.

27048. What do you mean exactly when in answer to our Question 15 (d), you say "certain instruments for giving occasional frightenings to the cultivators of uncompromising attitude may be found useful"? What sort of frightenings are you thinking of?—No legislation is necessary; all that I say is that lionising is necessary.

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27049. To frighten them?—Yes.

27050. On page 201 under the heading Agricultural Labour, Question 18, is the 'Pam' system, the system of small patches of cultivation at a distance from the village? Is that the interpretation of the word?—Yes; that is what I mean.

27051. Then how do you imagine Government could help to give protection to the cultivators in the matter of their own lives and crops and cattle?—Impounding of cattle should be undertaken and cheap fencing should be imported.

27052. The idea is that Government should help in fencing?—Yes.

27053. Are you a cultivator yourself?—Yes.

27054. How much land have you in your own hands?—About 40 *bighas* of paddy land.

27055. How long have you had this land in your hands?—For more than thirty years.

27056. What do you say about the fertility of The land when you first knew it and its fertility now?—It has deteriorated.

27057. How do you account for that fact?—Continued use of the land is responsible for it.

27058. Are you applying such manures and other fertilisers to the land as you used to apply?—It is impossible to apply manure to the entire land.

27059. Why is it impossible?—Owing to lack of labour and other difficulties.

27060. Is the labour problem a great problem on your piece of land?—Labour is not available at that time of the year when it is required. All men will be engaged in their own cultivation at that time.

27061. Do you buy any artificial manure for the land?—Yes.

27062. What class of artificial manure do you buy?—Bonemeal, oil-cake, nitrogenous fertilisers and other things.

27063. Do you find that they pay you?—Yes, I do.

27064. And if you had sufficient labour you would be prepared to buy more of them, is that the position?—Yes; for the paddy cultivation it is difficult to find labour; they want very high rates.

27065. How many pairs of bullocks do you keep for 40 *bighas*?—Four pairs.

27066. What do you feed them on in the season of fodder shortage?—Grass in the fields and straw at home.

27067. Have you ever attempted to grow any fodder crops?—Very few, Guinea grass, etc.

27068. Was that a success?—Yes, if I can cultivate it, but I cannot cultivate it.

27069. Why not?—Because I cultivate other food or grass.

27070. Do you mean it does not pay you or you cannot do it?—If I can cultivate fodder grass then it will be best for me.

27071. Will not Guinea grass grow on your land?—Yes, Guinea grass grows.

27072. Have you ever seen a method of preserving Guinea grass by what is called the silo?—Yes, I have seen it, but I cannot attempt it here.

27073. *Prof. Gangulee*: In your farming operations have you had any assistance from the Department of Agriculture?—I have merely had advice.

27074. Advice on what?—I have had twelve envelopes and twelve papers.

27075. What variety of grass do you grow on your land?—About twelve varieties.

27076. Have you received any variety from the Department of Agriculture?—No, but I have had some seed from the Government.

27077. So that besides twelve envelopes and papers you got some seed from the Government?—That was to demonstrate in the villages.

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27078. What profit per *bigha* do you get from your 40 *bighas* of paddy?—No profit; it may be possible for others to make a profit but I have not made any profit.

27079. You are Honorary Correspondent to the Agricultural Department, are you not?—Yes.

27080. What are your privileges and duties?—I have no particular privilege; sometimes seeds are given to me for examination and distribution.

27081. *Mr. Calvert*: You said you made a joint enquiry into the economics of a village; how long did that enquiry take?—It was eight or nine years ago; I tried for three years. The joint enquiry was done with the help of six or seven people for six or seven days but I personally enquired into the matter for about three years.

27082. Did you find that land was being sold?—Yes.

27083. Who was buying it?—The Marwaris were the purchasers.

27084. Not other cultivators?—In the locality where I carried on my enquiries the Marwaris were the only purchasers forthcoming.

27085. *Rai Bahadur H. M. Das*: On page 202 of your note you say, "Compulsory education in rural areas is very necessary." Do you think the cultivators will consider it a great hardship if compulsory education is introduced?—They might experience some hardship in the beginning, but they will get used to it and not mind it; they are all willing to have their sons educated.

27086. Have they sufficient means to bear the cost of educating their children? Of course, in Assam, primary education is free, but have the cultivators sufficient means to buy the necessary books?—All the people have not the means.

27087. Have the majority of them the means?—The majority of the cultivators cannot afford to purchase books for their children; they are too poor.

27088. *Sir Henry Lawrence*: You say you found that the Marwaris were buying land; did those Marwaris make any profit from buying that land?—Yes, they do get a profit.

27089. Do they get that land cultivated by tenants?—No, they sell the land to tea planters at high prices.

27090. That is the only way in which they get their profit?—They do not get the land cultivated by tenants.

27091. On page 203 you ask that the further extension of tea cultivation should be limited. What is your reason for wishing to stop further tea cultivation?—The area for tea ought to be limited.

27092. I ask you why do you wish it to be limited?—In order to increase the cultivation of staple food crops; if land is being absorbed by tea, there is very little land available for cultivation by other crops, particularly food crops, rice and other things.

27093. How many acres now are occupied by tea?—I cannot tell you exactly the area occupied by tea.

27094. Is it any large proportion as compared with the area occupied by food-grains?—About one-fifth of the area occupied by food-grains is absorbed by tea.

27095. Four-fifths by food-grains and one-fifth by tea?—Yes.

27096. Would you agree that there are 4 lakhs of acres of tea and 60 lakhs of acres of food-grains; would you accept that as correct?—I am not prepared to accept that as correct because I have not got the statistics.

27097. *Sir Thomas Middleton*: You have 40 *bighas* under paddy?—Yes.

27098. You have four pairs of bullocks?—Yes.

27099. Do those bullocks do any other work except cultivate the paddy?—Yes, some other work is done by one pair.

27100. Would three pairs of bullocks be enough to cultivate your 40 *bighas* of paddy?—No, they would not.

27101. How many weeks in the year are the bullocks idle?—Not more than 150 working days.

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27102. Do you breed or buy your bullocks?—Both purchase and breed.
27103. If you buy a pair of good bullocks, what does it cost you?—Rs. 85 a pair. That is just an ordinary pair of plough bullocks.
27104. When the bullocks are idle do you give them any food except rice straw and what they pick up?—No, nothing but straw.
27105. When they are working do you give them anything extra?—Some kind of rice preparation is given them; as the food is being boiled the scum comes out and that is given to the bullocks.
27106. But no kind of grain, no *dal*, of any kind?—No, no grain.
27107. Is that the custom through the whole district that the bullocks get no grain?—Grain is not given to this class of bullocks; grain is given to cows.
27108. Only if they are selling the milk from the cows?—Selling or using.
27109. How much do you give the cows?—Not more than five seers of bran and rice gruel.
27110. For how many days do you give five seers?—For two months only.
27111. But you do not mean you give five seers a day for two months; is it five seers a week?—It is given daily, not always but when it is convenient, not more than five seers.
27112. Mr. Heslett: With reference to what you said as to the proportion of tea and paddy land, is not tea land higher than paddy land; is it possible to grow tea on ordinary paddy land?—By draining, yes.
27113. I do not think it is possible; have you ever seen tea growing on ordinary paddy land?—I have seen it.
27114. Well, I have not?—Not a big garden but small pieces.
27115. What is the usual difference between the height of tea land and the height of paddy land; is it one foot higher?—Tea cannot be grown on low-lying land.
27116. Tea land is quite distinct from paddy land. Do you say it is possible to grow tea on paddy land?—Not on a big scale. Occasionally paddy land is converted into tea land; that can be done. If a corner is enclosed, that can be planted with tea.
27117. How do you make it into tea land; by raising it two or three feet?—The same level.
27118. Is it not necessary that tea land should be carefully drained so that it does not get water-logged?—Yes, a lot of draining is necessary.
27119. How are you going to drain paddy fields so as to make them into tea land; where is the outlet?—By making a big drain.
27120. Where are you going to drain it into; there is no land lower than the paddy land?—Paddy land on a big scale is not fit for tea.
27121. It is only fit for tea on a very small scale?—Yes, a very small scale.
27122. You are a cultivator?—Yes.
27123. It might interest the Members of the Commission if you told us exactly what you have done yourself, whether you have made a profit from your cultivation and what crops you have grown?—I grow all kinds of useful crops.
27124. Tell us the names of them?—Paddy, mustard, pulse, sugarcane, cotton, jute, potatoes, some vegetables.
27125. Prof. Gangulee: All that on 40 *bighas*?—No, in the garden parts.
27126. Mr. Heslett: You grow some *rabi* crops?—Yes.
27127. What area of *rabi* crops do you grow?—10 *bighas*.
27128. Do you grow mustard?—Yes, mustard.
27129. Have you ever tried sowing *masur* and mustard together in the same field?—Yes, I have.

27130. Was it successful?—Yes, *masur* and *khesari*.
 27131. You got both crops?—Yes.
 27132. Were both of them good crops?—Yes, both.
 27133. You suggest mixing *khesari* and paddy, sowing at the same time?—Yes.
 27134. Have you tried sowing paddy in the same field with *khesari*?—Yes.
 27135. What was the result; did you get good crops of both kinds?—Yes, I got good crops, but I cannot say how many maunds. I am always carrying out experiments.
 27136. Have you grown sugarcane?—Yes.
 27137. Did you grow the new varieties?—Yes.
 27138. Did they do well?—Yes.
 27139. Did the jackals eat any of them?—Some kinds have been spoiled by jackals.
 27140. What in your opinion is the best kind of sugarcane for the ordinary cultivator to grow?—Barbadoes.
 27141. There are several Barbadoes, which kind?—B. 147.
 27142. Is B. 147 a good kind of sugarcane?—It gives good crops.
 27143. Is the *tana* variety a good kind?—That is also good.
 27144. That does well?—Yes.
 27145. Have you actually grown these canes on your own ground?—Yes, on my own ground.
 27146. What new kinds of crops do you think the ordinary Assamese cultivator should grow during the cold weather and at other times of the year?—Sago, arrowroot, cassava, *matari* of different kinds.
 27147. Have you tried to grow arrowroot?—Yes.
 27148. Was it a good crop?—Yes.
 27149. And potatoes?—Yes, I grow some for nearly six or seven years and distributed seed.
 27150. Where did you get the seed potatoes from?—I got the seed potatoes from the seed depôt.
 27151. The local seed depôt here?—No, there is no seed depôt here. I suppose you got them from Gauhati.
 27152. What kind of fruit trees do you grow in your compound?—We only grow mangoes and jack.
 27153. And coconuts?—Yes, coconuts, but not so much.
 27154. Do you grow the betel-nut tree?—Yes, betel-nuts.
 27155. Do you grow *pan* leaves in your *bari*?—Yes.
 27156. Do you grow oranges?—Yes, oranges and lemons grow very well in Assam.
 27157. Pineapples?—Yes.
 27158. What kind of pineapples?—Several kinds of pineapples.
 27159. The local kind?—Yes, and several kinds distributed by the Government.
 27160. You grow all these fruits, vegetables and paddy; how do you lose by your cultivation?—It is my fault.
 27161. How is it your fault?—I experiment; it will ruin me but other people will in consequence make good profits.
 27162. *Rai Bahadur R. M. Das*: Is it not a fact that the honorary correspondent of the Agricultural Department gets seeds at half price?—Yes, there is a rule.
 27163. And yet you say they do not give you anything?—No.
 27164. *The Chairman*: Would you agree that there is a growing demand on the part of a large body of cultivators in this Province to have placed at their disposal the practical methods suggested by modern

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science?—Yes. May I add that the Members of the Agricultural Commission are in the position of doctors to cure the ills of the peasantry, and they should prescribe medicines for the ills of the peasants by examining their condition personally. I hope the Commission will go to the villages and see the conditions for themselves.

The Chairman: That is our intention, Rai Sahib. We are greatly obliged to you for your views. You may take it as quite certain that the interest of the cultivator is the first concern of this Commission.

(The witness withdrew.)

Mr. W. G. MoKercher, General Manager, Amgoorie Tea Estates, Ltd., and Vice-Chairman, Assam Branch of the Indian Tea Association.

Replies to the Questionnaire.

QUESTION 4.—ADMINISTRATION.—(c) (iii) Roads.—Road communications in Assam are now in an appalling condition, some districts, particularly Bishnath and North Lakhimpur on the north bank, and Moran, Jaipur and Golghat on the south bank being entirely cut off from their headquarters station during a considerable portion of the rainy season. The same remark applies to many rural areas throughout the Province.

Under these circumstances, it is impossible for those ryots who grow two crops in the year to market their produce, with the result they are entirely in the hands of local Marwaris to whom they mortgage their crops and ultimately sell them at a lower price than they could obtain in the local market.

If communications were improved and metalled roads made throughout the Province, lorries could be employed for the purpose of collecting, and as rapid transport, of the cultivators' produce to the local market.

Also free movement of the people is necessary to induce competition and gradually promote the spirit of competition and enterprise which is so lacking in the ryots of this Province.

The metalled roads in the Province total 400 odd miles, the unmetalled about 1,200 miles.

The metalled roads in the hills total 233 miles, and the unmetalled 122 miles.

Most of the metalled roads in the plains districts are in, and adjoining the towns.

In 1912-13 the Government of India allotted grants of about 25 lakhs for the purposes of the communications of the Province, since which date no further grants have been made by the Government of India.

Prior to 1912, no steps of any consequence were taken by the Local Government to improve the communications of the Province.

From 1915 to early this year, no appreciable capital sum has been allotted by the Local Government for non-recurring expenditure on road communications.

Owing to the pressure brought by the Assam Valley planting representatives on the Local Government this year, a scheme estimated at about 15 lakhs has been entered into for the purpose of the improvement of the road communications in Assam. The Local Government, however, have given no guarantee that this expenditure will be of a recurring nature and this alone handicaps the P.W.D. in making permanent arrangements for the future improvements of the road communications of the Province.

The planting community fully realise the importance to the Province of good communications and have this year agreed to an increase of the local rate on tea lands which is expected to produce from one to two lakhs per annum for roads.

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Taxation by the Central Government.—While neither Bengal nor Bihar and Orissa Governments have ever paid any provincial contributions to the Government of India, the far more backward Province of Assam is severely taxed, approximately as follows:—

Export duty received from Assam	...	...	...	30	laks.
Income-tax from Assam	...	...	...	15	"
Import duty on tea boxes	...	...	...	10	"
Petrol duty	...	...	...	14	"
Provincial contribution	...	...	...	15	"
Total				71½	"

Over and above this taxation, the Local Government have the expense of keeping up the hill districts which should be the duty of the Government of India. The annual loss in 1923-24 incurred in connection with the four hill districts, viz., Garo Hills, Khasi and Jaintia Hills, Lusai Hills and Naga Hills, amounted to nearly seven lakhs.

Besides these are the Balipara Frontier Tract and the Sadiya Frontier Tract for which I have no figure.

Export duty.—This duty of Rs. 1-8-0 per 100 lbs. was imposed on tea in 1916 with a view to obtaining increased revenue which was urgently required. The finances of the Government of India have now so much improved that there should be no reason for its retention.

The Fiscal Commission of 1921-22 in paragraph 182 laid down the principle that export duty for revenue purposes should be employed sparingly and with great caution and that they should be imposed only on articles in which India has a monopoly or semi-monopoly. In paragraph 187 the Commission held that the duty could hardly be said to comply with their condition that the article should be a monopoly or semi-monopoly and they therefore held that the export duty on tea should be removed. The Indian Taxation Enquiry Committee, 1924-25, although they accepted the Fiscal Commission's principle above stated (*vide* paragraph 161 of their report), advised the duty might continue for the present but that it should be *removed or reduced if and when the conditions of the trade indicate that it is having a prejudicial effect* (*vide* paragraph 158). They advise shutting the stable door after the horse has bolted!

"Sir Basil Blackett in the Legislative Assembly, in August last, is reported by the Associated Press to have stated as follows:—

"Sir Basil Blackett confessed his disappointment that the Todhunter Committee had gone back on the wiser view of the Fiscal Commission on export duty, especially regarding the undesirability of using export duties for protective purposes."

There is no doubt the Government of India do not approve the principle of the export duty on tea but decline to abolish it owing to the loss of 50 lakhs per annum. In other words, the Province of Assam is being robbed by the Government of India to the extent of 30 lakhs per annum for the benefit of the other Provincial Governments.

Sir John Kerr in a speech at his first Durbar after his taking over charge as Governor of Assam stated that he much regretted the extent to which the Government of India were taxing the tea industry as it precluded him from further taxing it for the benefit of the Province.

The Assam Legislative Council have, on more than one occasion, passed resolutions recommending the Local Government to request the Government of India to abolish the duty.

QUESTION 6.—AGRICULTURAL INDENTEDNESS.—(a) (i) The main cause of borrowing is lack of enterprise.

(ii) *Kyaks* and shopkeepers, interested in the ryots' produce.

(iii) Lack of remunerative occupation during nine months of the year; insufficient return from their holdings; high rates of interest on borrowed money; and increased cost of living.

Paddy cultivation is the chief occupation of the ryot in this district. He gets one crop per annum only. The average area of the plot of land held by each ryot is about three *poorahs* (four acres).

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The period of occupation—cultivating and reaping three months—is for male labour only 80 working days, and for female labour only 50 working days. Frequently the ryot has no other occupation; he depends on three months' labour for his income, and in the event of a poor crop appeals to the moneylender.

The moneylender is generally the local *Pathar* or shepherd—who advances money to the ryot, usually for a period of three months.

Interest on loans is reported to vary from 5% to 150 per cent. Failing repayment within the time limit a portion of the crop is accepted at preferential rate. Estimated average yield from 5 pounds is 50 maunds of threshed paddy.

Value if sold at Rs. 2500 per maund is	...	Rs.	1250
Less cost Rs. 24 and seed Rs. 12	...	...	36
Net income	...	...	1214
			per annum.

QUESTION 11.—CROPS.—(a) (i) Wild elephants are becoming too numerous and causing destruction to the ryots' crops in Nowgong Sub-division and parts of Lablaspur. *Khodai* operations are necessary.

ORIGINS 15.—VETERINARY.—(a) I consider the Civil Veterinary Department should be independent and free from any ponderous system likely to cause delay. Epidemics require urgent action.

(b) (i) Dispensaries are controlled by Local Boards. I consider this a ponderous system. For instance, in the season in 1926, epidemics of anthrax, septicaemia, *gambusia* and foot-and-mouth disease were rampant throughout Assam. The mortality in some parts of the Sibsagar district is estimated at nearly 50 per cent of the herds.

(ii) Not adequately met.

(iii) I advocate the transfer of control to provincial authority.

(c) (i) Veterinary Surgeons are insufficient during periods of severe epidemics. They frequently arrive on the scene too late, the conservative ryots quickly lose confidence, and the disease is permitted to spread.

Suggest improved concentration in conjunction with animal husbandry experts.

Epidemics generally spread from one or two centres; concentration of forces might frequently prevent.

Issue literature in the vernacular on diseases and treatment.

(ii) Ryots are frequently slack in reporting outbreaks.

(d) I advocate legislation dealing with notification for segregation, disposal of diseased carcasses, compulsory inoculation of contacts, and prohibition of the movement of animals exposed to infection.

Burning of carcasses is opposed by some castes and in these cases quicklime should be available to bury with the carcasses.

(e) I believe there was some difficulty in obtaining efficient serum in 1926, but it must be remembered the demand for serum was very much in excess of normal years.

(f) No fee is charged for inoculation.

Lack of faith in the treatment is the chief obstacle.

Prostration is responsible for many fatal cases.

(g) I do.

(i) I have no knowledge regarding Mukti-ar Institute.

(ii) I recommend provincial veterinary research institutions.

(h) Yes, by research officers in the Provinces.

(i) I do not recommend the appointment of a Superior Veterinary Officer with the Government of India but I consider the Government of India should assist the Provincial Government more liberally with funds.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) I suggest the employment of travelling breeding experts in conjunction with Veterinary Department if possible, and expert castration of all weedy bulls and importation of

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desirable breeds of bulls. Imported bulls should be stall-fed and not allowed to roam with herds, wearing themselves out for no practical purpose, and risking diseases very prevalent on general grazing grounds.

The *gaonbura* of the village might be responsible to the travelling expert for the bull, charging the ryots a small fee for service, towards the cost of upkeep. The bulls should be the property of Government. Periodical exchange of bulls from one district to another would tend to improve the breeds of cattle.

(ii) I suggest a grazing area for each village to prevent disease spreading, improved breeds of cattle and pastures.

Metal roads and motor transport are also very important factors, as during eight months of the year Assam roads are impassable and the ryot has no market for his produce, if produced.

(iii) Expert advice including veterinary treatment by lectures; also the issue of literature written in the vernacular.

(b) (i) Grazing areas are insufficient, badly distributed, and the pastures very inferior, frequently consisting of plots of waste land not required for any other purpose.

To the best of my knowledge, manures for improving pastures are never applied.

(ii) Paddy fields are flooded during the crop season. The Government roads may provide a little grazing, otherwise the cattle must travel to the grazing ground, sometimes a couple of miles distant. After the crops are reaped, cattle wander over the rice fields.

(iii) *A limited supply of paddy straw is available.*

(iv) The Assam dry weather is usually not very severe on pastures.

(v) Lack of lime in Assam soils is supposed to be responsible for the small bone in Assam bred cattle. Expert opinion is desirable on this point.

NOTE.—I consider Government assistance in animal husbandry is most essential and together with roads first in importance for the welfare of the Province.

In spite of large herds, milk is difficult to obtain. Swiss milk is freely imported into the Province.

Cream on the milk produced by the Assamese cow is a stranger, and butter unobtainable.

One of the chief difficulties in obtaining extra grazing grounds at convenient centres is due to opposition from the ryot, who cannot afford to give up any part of his small holding for the benefit of his neighbours.

As it is desirable for each village to have its own grazing ground in order to limit the spreading of disease, liberal terms for land acquired are essential.

In Silsagar district, during 1926, the loss of cattle due to epidemics will probably exceed any previous record.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) *Paddy cultivation*.—Suppose the average ryot cultivates three *poorahs* of paddy (usual work for one pair of bullocks). In June, a plot for seedlings is prepared which provides employment to one man for fifteen days. In July-August, the area to be planted generally requires ploughing five times, each *poorah* occupies three days of about two to three hours' work per day. Planting done by female labour occupies four days per *poorah*. Reaping is also done by female labour at four days per *poorah*. Carrying and storing by male labour, say, twelve days for three *poorahs*.

Male Labour—Preparing seedlings	...	...	...	15 days.
Ploughing 3×3×3	...	...	...	45 "
Carrying and storing	...	...	...	12 "
Fencing and repairs to bunds	...	...	...	8 "
Employment for a man per annum	...	...	...	80 "
Female Labour—Planting	12 "
Reaping	12 "
Employment for woman on holding	24 "

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Occupation during slack season practically nil.

(b) Encourage the weaving of Assam silk by planting *soom* trees on the waste land surrounding villages—rent free until the trees reach the producing age.

There is a good market for poultry and goats which do well in Assam.

Sheep-rearing is too risky on our damp soils for the ryot's capital.

(c) The increasing scarcity of fish in the Province indicates the necessity for enquiry into the preservation of small fry by—

(1) a fixed size of mesh for fishing nets;

(2) prevention of the use of poison in rivers.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) (i) and (ii) Obtain the whole-hearted support of Provincial Government, to encourage emigration of their surplus labour to the tea gardens which depend entirely on imported labour both for the cultivation of existing areas and the extension of new areas.

The above applies both to permanent settlement and seasonable migration.

(b) The principal factors in the shortage of labour in Assam tea gardens, and the recruitment of labour are—

(1) The loss due to the rapid colonisation of Assam by time-expired tea garden coolies.

(2) Expansion of the industry.

(3) The All-India influenza epidemic seriously reduced the agricultural population both in Assam and throughout the recruiting districts.

(4) (a) No famine in the recruiting districts during recent years.

(b) Expansion of railways and industries increasing the demand for labour in the recruiting districts.

NOTE.—The area settled with time-expired coolies in the Assam Valley (including Sadiya and Balipara Tracts) is approximately 290,261 acres—a larger area than the whole area under tea in the Assam Valley. (The area under tea in 1923 was 266,866 acres.)

In the Surma Valley approximately 35,307 acres are settled with ex-tea garden coolies. (The total area under tea in 1923 in the Surma Valley is given as 144,941 acres.)

(c) Waste areas are being rapidly filled by ex-tea garden labourers and immigrants from Eastern Bengal and Nepal.

QUESTION 19.—FORESTS.—The danger of a scarcity of thatch and firewood in the near future, requires consideration, in the interests of the poorer class of ryots.

In the neighbourhood of many villages, afforestation and thatch-reserves are desirable before scarcity becomes too acute.

The *jhuming* system of cultivation should be stopped.

The growing of sugarcane will quickly impoverish the soil unless manures are applied. Some form of limitation is desirable, to prevent exploitation.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—I consider the import duty on galvanized corrugated iron and building materials is a severe hardship on the Indian cultivator in districts where thatch is unobtainable.

Oral Evidence.

27165. *The Chairman*: Mr. McKercher, you are General Manager of the Amgoorie Tea Estates, Limited, and Vice-Chairman of the Assam Branch of the Indian Tea Association?—Yes.

27166. Do you wish to make any statement of a general character at this stage or shall I ask you one or two questions?—I have submitted my general remarks in writing. You may ask me questions.

27167. I see under the head 'Roads' you complain of the state of roads in this Province. I should like to know how long you have been in this Province?—Thirty-two years.

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27168. Are the roads better or worse as compared with their condition when you first knew them?—I would not say they are worse as compared with their condition when I first knew them; but within the last ten years they have grown worse.

27169. What is the reason?—The cost of labour has doubled and the allotment for roads has grown small accordingly; and also motor traffic is increasing.

27170. Would you say the state of the roads places a burden and handicap on the tea industry?—Yes, I would.

27171. In what way?—For getting about, for everything.

27172. I might have put my question another way; is the state of the roads so bad that there is difficulty in getting the tea either to the ports or to the railways?—No; we generally use our own independent tram lines; but anybody using the roads will find a difficulty.

27173. It is in the ordinary business of management and the general conduct of life that these roads handicap the industry?—Yes.

27174. Are you familiar with the working of the local authority in relation to its responsibility for the roads?—Yes; I am a member of the Local Board, and also on the Finance Committee.

27175. What is the position of the Local Boards?—They are always handicapped for money. I know of one district in which only one brick bridge has been constructed for the last thirty years over an area of twenty miles square. All the money we get has got to be used for filling up the holes.

27176. Have you any constructive suggestions to make for remedying this unfortunate position?—Only what I have written.

27177. Nothing beyond your note?—I should like to point out that, taking an average yield of eight maunds per acre, the export duty on tea from Assam and the import duty on tea boxes work out to Rs. 12-12-0 per acre.

27178. What about the roads of the District Board of which you are a member?—I am from the Sibsagar district. I am referring in my written evidence to the Public Works Department roads, not to the second-class roads.

27179. You are giving the mileage of Public Works Department roads, not District Board roads?—There are about 3,000 or 4,000 miles of District Board roads; I am not referring to that.

27180. You mention the question of the provision which Government have made this year, but you say there is no guarantee that this will be of a recurring nature. Was there any suggestion that it should be of a recurring nature?—Well, Government could not promise. We asked the Member at a meeting the other day, and he said he could not make any promise. He is as handicapped as the others.

27181. You have come to the point where you think that further taxation is essential?—I do not say that. But we have come to the point where I consider that Assam should get more from the Central Government.

27182. I am looking to your own words, on page 208, "The planting community fully realise the importance to the Province of good communications and have this year agreed to an increase of the local rate on tea lands." To that extent I was right, I suppose?—Yes. But I would like to push home the other point. Assam gets nothing from the export duty on Assam tea, which is 30 lakhs. Then there is the income-tax 15 lakhs; import duty on tea boxes 10 lakhs; petrol duty 1½ lakhs; provincial contribution 15 lakhs; total 71½ lakhs. The Assam ryot cannot afford to pay more revenue. The only industry in Assam is the tea industry, and the Central Government takes away the lot.

27183. You refer on page 209 to the abolition of the export tax on tea. If this tax were admitted to the provincial revenues; do you think that there would be any objection to the paying of it by the tea plantations?—I am not in a position to say that. I say we have been fully taxed and we cannot help the Province. I should not like to take any responsibility for answering your question.

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27181. On the question of Agricultural Indebtedness, on page 210 you give figures as to seasonal lack of employment and you say, "The period of occupation—cultivating and reaping three *poorahs*—is for male labour only 80 working days and for female labour only 30 working days." How did you arrive at these figures?—From practical experience. I have been thirty years in Assam; our own coolies get a lot of land, they have 1,071 acres which they cultivate round the gardens, and I know a great deal on that subject.

27185. Is malaria prevalent in the districts with which you are most familiar?—It is seasonal. In some years we get more than in others, but our death rates are not high.

27186. Can you estimate the number of days during which the average ryot is laid up?—I can give our own figures of actual attendance if they will be of any help.*

27187. They might be useful. Is it a long table?—No. I may give the average of the nine months from January to October. The average percentage working for one garden is, men 79, women 58, children 73; for another group 82, 61 and 68; for a third, 68, 68 and 79; for a fourth, 85, 75 and 84. During advanced pregnancy and on wet days women do not work. So, that has to be calculated in the case of women.

27188. You are familiar, I think, with the work that is being carried out at the moment under the direction of Dr. Ross?—I am not in that district, but I have been to his lectures.

27189. But you know about his efforts?—Yes.

27190. Do you think it is possible to apply his methods to the ordinary zamindari or ryotwari districts?—I do not think so; they are expensive.

27191. Do you think any efficacious methods exist which might be applied to typical rural areas?—The Assamese villagers in the plains do not suffer from malaria to the extent that the coolies in the gardens do. This draining is a peculiar thing. I am very sorry to say that I am not in favour of draining these areas. If you do, you will be ruining their rice cultivation.

27192. Malaria is a more urgent problem with the jungle tribes?—Yes, in the jungles. I listened very carefully to Dr. Ross's lecture the other day at Dibrugarh, and I made up my mind that I should not touch his methods; I should rather depend upon our doctors. We have got 12,000 acres, and at £1-10-0 per acre for draining and maintenance we should have to spend £18,000 in two years, not to mention the labour which the gardens have to supply themselves. After drains are cut, they must be kept clean and cavities treated with oil. It is an impossible proposition in a large area.

27193. You do not think this plan is practicable in the case of a typical area, and you do not feel disposed yourself to undertake it on your own tea estates?—I will do it in a limited degree as regards jungles, but I cannot divert 50 per cent of the labour and establishment for the work.

27194. Is shortage of labour one of the pressing problems of the tea industry to-day?—Yes.

27195. On page 212 you give a list of some of the causes of that shortage. Are they in the order of their importance? Is the first "The loss due to the rapid colonisation of Assam by time-expired tea garden coolies" the most important?—Yes. I would not put (2) "Expansion of the industry" before (3) "The All-India influenza epidemic."

27196. Take the first, "The loss due to the rapid colonisation of Assam by time-expired tea garden coolies." Would you suggest any remedy for that?—No; I cannot. It is only a natural thing.

27197. (2) "Expansion of the industry", there is no remedy for that, I suppose?—No remedy.

27198. (3) "Influenza epidemic", what about that?—That is finished;—I hope it will not recur.

27199. (4) (a) "No famine in the recruiting districts during recent years"; we can hardly arrange for famines?—No remedy for that.

27200. (4) (b) "Expansion of railways and industries." From the All-India point of view you can hardly deplore that?—No; I have nothing against that.

* Vide Appendix I.

27201. Have you any concrete or constructive suggestions to put before the Commission for the amelioration of this position?—I think we require the whole-hearted support of the Provincial Governments, because we all know that cheap labour is a very useful thing in all the different Provinces. I think if the Government would trust us as regards recruitment, it would help us. There are many restrictions at present and we are trying to get those removed. We are not always trusted. Act VI has been practically abolished; a few recruiting clauses are all that remain of it; we are trying to get new rules.

27202. Is it really an attempt to re-establish mass recruiting under proper control?—Yes.

27203. At the time when the new legislation came under criticism and the rules were passed, did the Tea Association exist?—Yes.

27204. Is it your view that the Association was such as to be in a position to give guarantee that it would bring disciplinary action to bear on members who were in default in carrying out the undertaking given to Government?—Do you mean as regards the new proposals? Have you seen those?

27205. I am asking you in general terms, whether the Association can step in and take the responsibility?—We are proposing to have a Recruiting Board, if it is sanctioned; that I think will take full responsibility.

27206. As an Association?—Yes. Government will have a control and will have an official Chairman on the Board.

27207. Are you not a little drastic when on page 212 you say, "The *jhuming* system of cultivation should be stopped?"—I am afraid the deterioration of the jungles is so rapid in Assam and firewood is becoming so scarce that it is necessary. These people burn the trees in a small area, cultivate it for one year and then leave it and go to another area. They do not even use the trees; they burn them.

27208. Do you agree that those tribes who are in the habit of obtaining a living by the *jhuming* system should be taught the art of creating minor irrigation schemes?—I think so.

27209. In fact, it would make a considerable contribution towards the solution of this problem?—I think so. They are an amenable group, although some of the Nepalese are very bad.

27210. It might be possible to terrace some of these lands brought under *jhuming*?—Yes. At present the practice does a lot of damage.

27211. Do you know whether there is any technical officer competent in the art of irrigation whose advice would be at the disposal of cultivators or villagers anxious to adopt any such scheme as we are discussing?—I do not think so.

27212. On the same page you suggest that the fishing might be improved by the prevention of the use of poison in rivers. Is it a common custom?—The hill tribes poison the rivers and kill the whole of the fry. Fish is getting more and more difficult to obtain.

27213. What do they use?—*Naga-bih* and *Khoni-bih*. The former is a poisonous creeper. The latter (aconite) is like a small egg. They put these in the rapids right across the river and *Khoni-bih* is dangerous. *Bih* signifies poison.

27214. Coming to a very different subject, you are familiar with the research work being carried out by the Indian Tea Association?—Yes.

27215. Have you interested yourself at all in any of the technical details of that work?—In what way?

27216. Do you know whether there are certain problems of fundamental importance and general application which are being investigated at the moment and others which require investigation, which in the view of some responsible people might very well be undertaken by the Central Government's institution at Pusa?—I would not care to answer that; I leave that to Mr. Carpenter.

27217. Sir Thomas Middleton: On page 211 you give the details of the time occupied in rice cultivation, and you estimate the amount of time required to plant an acre of paddy?—I have taken three *poorahs* of paddy, that is the usual area for one pair of bullocks.

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27218. You estimate four days per *poorah* for planting; that is, three days per acre?—Yes. That is for planting and cutting. I have talked to the villagers, and that is what they allow.

27219. That is woman labour?—Yes; planting is woman labour.

27220. When you come to ploughing, you have got 45 days for three *poorahs*; that will be 34 days for ploughing three acres?—Yes. It is practically 11 days per acre. In England they plough one acre in one day. (One man and two horses.)

27221. How many ploughings do you allow them?—Five.

27222. That gives about 11 days for five ploughings per acre. That is about two days an acre for one ploughing?—About two and a quarter days.

27223. I have been comparing your man and woman labour. Your women seem to work faster than your men?—Yes. Generally the women carry loads on their heads when the men go without any load.

27224. What I gather from your figures is that women show relatively a high efficiency in your area?—That is so; but, on the other hand, they work a smaller number of days in the year. Another thing that I can tell you is that when you commence planting, you cannot wait for the water to dry up though you can do the ploughing as you like.

27225. I only wished to clear up this point about the relative efficiency?—I am glad to be able to help you; I am keen on it myself.

27226. *Dr. Hyder*: What is this rate to which you are referring, to which the Tea Association has agreed? Is it the acreage rate of 8 annas, or is it the local rate?—I cannot tell you anything about the 8-anna rate at all; I think it was discarded; we shall now voluntarily pay 5 annas.

27227. That is the additional rate to which you are referring? Was not the 8-anna rate thrown out in the Council?—This is the rate of 5 annas per acre that was proposed last September; it is the latest.

27228. With regard to the taxation by the Central Government, do you get anything at present from income-tax?—I think Assam gets so much for collecting it on behalf of the Central Government.

27229. Do you not get anything when it exceeds the datum line of 1921?

Mr. Hazlett: The Central Government pay for the cost of collection, plus 3 pies in the rupee above the datum line, which accounts for a good deal of the revenue in Assam, because a new method of assessment was introduced in regard to tea since 1920-21. Tea is now assessed at 25 per cent of the profit; 25 per cent is looked upon as the manufacturers' profits and 75 per cent as the agricultural profit.

Dr. Hyder: You do get something from the difference, and you are not in the same position as other Provinces?

27230. *Mr. Hazlett*: We get more from income-tax in proportion to the total realised from income-tax, because of the new method of assessing the tea industry?—That is another imposition. You may say that we have a factory, simply because we have got a steam-engine or something, and just get more money out of us.

27231. With regard to this matter of Rs. 7½ lakhs, you share this misfortune with other Provinces in India; that is what you pay to the Central Government? You pay income-tax, export duty and import duty?—I have made a note of other taxes that we have to pay.

27232. The export duty received from Assam is Rs. 30 lakhs, and the income-tax from Assam is Rs. 15 lakhs. These are misfortunes which you share with other Provinces?—I should like to point out that there is an additional import duty on tea boxes which with export duty comes to Rs. 20 per *poorah*, and on the top of that we pay other rates.

27233. The petrol duty is also a misfortune which you share with others?—Yes, but I would give it to the Imperial Government and take the rest.

27234. What do you include in this figure of Rs. 7½ lakhs? Does it include the pay of Political Agents, the maintenance of some irregular force, the cost of policing the frontier districts?—Yes; the frontier tracts are run at a loss; they cannot pay their way; the rest of the Province has to carry them and pay these taxes that I have mentioned.

27235. Nothing is contributed towards that by the Central Government?—To the best of my knowledge, no.

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27236. Is anything paid by the Central Government towards the maintenance of the Assam Rifles?—Might I ask you whether the other Provinces on the North-West Frontier pay towards the maintenance of the Army?

27237. This is the point on which I expressed agreement with you?—I think we are greatly handicapped; our Government have not got the power to do their work in an efficient way.

27238. This is an Imperial charge, and ought to be met by the Imperial Government?—I think the Imperial Government should be more merciful to us.

27239. With regard to the export duty, if the Central Government washed its hand of this duty, what are you going to do? Either you are going to put an acreage rate, or you are going to have some kind of export duty on tea passing down the Brahmaputra?—I think if the export duty were removed, we should be able to help Assam.

27240. The only two ways are either an additional acreage duty or an export duty on tea grown in Assam? Is there any third way?—If we are relieved from Imperial taxation (these two are not fair taxes in our opinion) we should be in a better position to help the Assam Government. If they repeal this export duty, which they must sooner or later, the Assam Government would get a greater revenue from us.

27241. The point is this. You refer to the Taxation Committee's recommendation to continue the duty for the present. If this duty were removed by the Central Government, and the Assam Government imposed an acreage rate or an export duty, it would be like putting pig on pork. It is just the same thing, so far as you are concerned?—No; Assam would develop.

27242. The whole point is with regard to its being sound or unsound. If your view is accepted, then it would become a matter as to who gets the duty? At present the Central Government gets it?—At present it does; in the other case, the Assam Government would get it.

27243. In that case, it would be more or less a transfer of funds? The nature of the duty imposed, of which you are complaining, would not be altered?—Capital makes capital.

27244. On page 209 of your memorandum, you have quoted an extract from the speech of the Finance Member. Does the export duty on tea protect the tea industry? It is a revenue duty, is it not? You have stated that the Finance Member was reported by the Associated Press as having said "Sir Basil Blackett confessed the disappointment that the Todhunter Committee had gone back on the wiser view of the Fiscal Commission on export duty, especially regarding the undesirability of using export duties for protective purposes." I ask you whether this export duty on tea has the effect of protecting the tea industry?—I do not quite follow you.

27245. What is the meaning of this quotation?—That is an extract from the speech of Sir Basil Blackett, taken from the paper, in which he agrees with the views of the Fiscal Commission.

27246. The only point I am concerned about is this: what is its relevancy to the tea export duty?—I think it is generally agreed that the tea export duty is scarcely fair. It was a War measure, and when the War was over, it should have been removed; there is no doubt about that, but we have not been strong enough to get it removed.

27247. Is it doing you harm?—Undoubtedly.

27248. Are you losing markets?—We are handicapped in the Province.

27249. That is one difficulty?—We are the black sheep of the Province; though we pay treble the revenue and taxes, still we are useless to the Province; that is the Assamese view.

27250. Are you being handicapped in foreign markets through this duty?—I would not say foreign markets, but we have been handicapped in expanding our industry and everything else.

27251. What is your present system with regard to the recruitment of labour?—The system of the *sardar*, principally.

27252. You do not approve of it?—I approve of it, but we should like to have a cheaper system. The *sardari* system is very expensive. With

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the numerous taxes we have to pay, it comes to a cost of about Rs. 200 per coolie. We have to send the *sardar* down to start with; we pay a cess to the Local Government for sending him, a license fee of Rs. 3; in addition we have to pay a capitation fee of Rs. 15 for the *sardar* to Indian States and Rs. 5 to the Association. For every immigrant we have to pay Rs. 5, and a cess of Rs. 3; then there is the Ten Districts Labour Association capitation fee of Rs. 15; there are also other overhead expenses; for clothing we have to pay Rs. 12-8-0 for an adult and Rs. 4-4-0 for a child.*

27253. What specific points do you complain of in the present system?—I think there are too many restrictions, some of which should be done away with.

27254. Could you name them?—Registration before the Government; they are Government restrictions; we have to send the *sardar* down to import immigrants.

27255. How did you do this before?—In the old days they came to us through contractors; they gave us a black name; since then it is always done through the *sardar*.

27256. *The Chairman*: Dr. Hyder and you have been discussing between you this question of the quotation from Sir Basil Blackett's speech in the Legislative Assembly, of which you have given an extract on page 209 of your note; are you sure that that is a correct rendering of that speech?—It is in our records; we got it from a newspaper.

27257. I have not the context in my mind. How do you use an export duty for protective purposes? I am concerned with Sir Basil Blackett's argument?—I suppose it is to assist paying for others; you know there are these subsidies and things of that kind; that is how I read it.

27258. Do you mean that the revenues resulting from this export tax were to be applied to the granting of subsidies to some other industries?—That is how I read it. It is rather a round-about rendering.

27259. *Mr. Hazlett*: You say that the chief problem in this country is one of better roads; I suppose you are aware that a metalled road in Assam costs Rs. 20,000 per mile?—Yes.

27260. Therefore, it is a very expensive job, which is beyond the finances of the Province for many years to come. Have you ever considered any system of keeping the *kutchra* roads in better condition?—It is a question of having more money.

27261. Do you think that the money which the Local Boards and Government spend on roads could not be better spent than it is at present?—You have been in Assam for many years, and you know that in the old days we got Rs. 100 per mile for first-class roads and Rs. 50 per mile for second-class roads; we are still getting money at the same rate, but the cost of labour has more than doubled.

27262. The revenue of the Local Boards has not increased but the cost of labour has risen?—Yes. The Local Boards are always starved, and they are handicapped just as much as Government.

27263. Have you ever noticed, going along any of our roads, that some portions of the road here and there are quite good? No matter how bad the road may be, you find some parts quite good?—Yes.

27264. What, do you think, is the reason for that?—The soil, and also the traffic.

27265. But the same traffic goes all over the road?—Yes; it may be due to *pan* on the sandy soil.

27266. Could not the Local Boards analyse the soil at those particular places and find out the proportion of sand and clay, and get better roads by mixing sand and clay in the same proportion?—Do you not consider it would cost just as much as metalling the road? Besides, you have to remember the rainfall, which washes down the soil to the extent of six to seven inches in the year. If you put bricks in holes of that depth, you will find that in a couple of years, all the soil is washed down, and that is the highest place; I have personal experience of it. As one of the engineers stated last year, if you make an improvement this year, it is washed away by the next rains.

*Vide Appendix IV.

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27267. Metallising costs so much, that is the difficulty?—Capital makes capital.

27268. You mention the fact that the Assam Government has ~~set up~~ up five hill districts at great expense. Are you aware that the Government of India pay most of the cost of the Assam Rifles?—What is the cost?

27269. The total cost is Rs. 17½ lakhs; are you aware that the Government of India pay Rs. 16 lakhs?—They make Rs. 70 lakhs out of us, they could still allow us a little more money.

Yes; they could give something. I only gave you the figures from memory, I cannot guarantee their accuracy.

27270. You mentioned that you had some idea of *phuming*; do you think that *phuming* should be stopped?—Yes.

27271. What other form of cultivation would you suggest these hill tribes should take up?—I think they should be made to stick to their own land. There used to be very fine forest land slopes which have been damaged; I think they are wasting their land, and it must affect the rainfall sooner or later.

27272. The Chairman: Is it reducing the rainfall?—We think that the absence of forests reduces the rainfall on these hills.

27273. Prof. Gangulee: On page 208, you say, "Under these circumstances, it is impossible for those ryots who grow two crops in the year to market their produce." Are there many people in the neighbourhood who can grow two crops?—It is not worth the trouble. The cultivator will have to carry the produce on his back a long distance to the market, which he cannot do.

27274. You suggest that they can grow two crops, and that the other conditions are favourable for it?—I do not see why they should not; of course, I do not say paddy and another crop, at present they can take part of the area for one crop and part for another, and thus grow two crops.

27275. You do not suggest that the other conditions are quite favourable for two crops?—I have no experience of that. The great thing about paddy lands is that you must not break the *pan* beyond a depth of six inches. By taking a certain area of the holding for one crop and another for another crop, it would pay them, if they could get rid of the produce.

27276. The only handicap is absence of better communications?—That is my opinion.

27277. The Chairman: Does not the importance of the *pan* depend almost entirely upon the nature of the sub-soil?—Yes.

27278. In some areas, you can afford to break the *pan* with impunity?—I would not say that for rice cultivation.

27279. Prof. Gangulee: In the tea garden districts, the other conditions are quite favourable for two crops, and only lack of better communications prevents them from going in for it?—That is my opinion.

27280. In the next sentence you say, "They are entirely in the hands of local Marwaris to whom they mortgage their crops." Are the cultivators compelled to mortgage their crops only because of the absence of better roads?—You are asking me a very pointed question. I consider that there is certainly a lack of better roads, and I certainly think it has a great deal to do with handicapping the improvement of the condition of the people.

27281. But the other conditions may be such that they are perhaps compelled to mortgage their crops to the Marwaris in any case, whether there are good roads or not?—I think they would get a better market if there were better roads.

27282. Do you get temporary labour in the tea districts?—Yes.

27283. What proportion of the total labour force in the tea districts may be put down as permanent settlers?—Taking the average attendance at work in 1925, the figures are permanent labour 401,221 living on the gardens; labour that was more or less living on the grounds was 30,252, that is what we call permanent outside labour. The outside imported labour, from Lower Assam and Cachar hills, etc., was 36,023.

27284. That was temporary labour?—Yes, from three to six months.

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27285. It may be that they worked on your estates during their period of unemployment?—Yes.

27286. You depend for the tea industry more on temporary labourers than on permanent labourers?—We depend more on permanent labour.

27287. Are these labourers, who are permanently settled, recruited from aboriginal tribes?—They are all imported.

27288. From Chota Nagpur?—Yes.

27289. What are the average rates?—I have handed in two statements, one of which is the average monthly earnings in our plantations which is rather interesting compared with family budgets of cotton mill workers in Sholapur. The other is concerned with the efficiency.

27290. The Chairman: Of the two tables, table A* relates to efficiency; is the percentage of daily attendance the measure of efficiency?—Yes.

27291. The table marked B† is the average monthly family earnings for 1926; that is for one man, one woman and one boy?—Yes. Silsagar district is about the average for Assam; in Lower Assam it may be a little lower, and in Upper Assam it may be a little higher.

27292. Prof. Gangulee: I know very little about the various systems of wages that you follow here. There is such a thing as *hazari*?—It is an old Assamese word for the first period. In the old days every one went out in the morning for two or three hours for their *hazari*, in the afternoon they again went out and did *ticca*, that is overtime.

27293. The permanent labourers get *hazari* and *ticca*?—Yes; in various gardens we pay a good deal for extra work done. Some of them do it, others do not.

27294. Besides *ticca*, is there not also a unit system? What is that?—I think that will be the future system; you give so much for each unit of work and they can do as much as they like.

27295. That system is applicable both to the permanent and temporary labourers?—We apply it to every one.

27296. There is no difference between the permanent and temporary labourers?—I am inclined to pay my permanent labour a little better than the temporary labour, because they have to go out on wet days as well as on dry days, but the usual thing is about the same for both.

27297. Dr. Hyder: What is the existing machinery for the control of recruitment?—There is the Labour Board.

27298. Is it appointed by the Government of India?—There is a Government official who is the Chairman; there are so many men from Calcutta Agency Houses and so many men representing the gardens; I am one of the latter; I think there are four others.

27299. How many representatives from Government?—One official of Government who is the Chairman. At present he is Mr. Austin, a Madras Civil Servant.

27300. Prof. Gangulee: That is the machinery which controls your recruitment?—Yes.

27301. Is the *sardari* system still going on? Is recruitment still done only through the *sardar*?—Only through the *sardar*; but we are asking Government, in times of distress and famine to send labour up through the Tea District Labour Association local agents, under the sanction of the Labour Board. The Labour Board has nothing to do with recruiting; it is a controlling Board, to stop anything going wrong.

27302. In your reports, I find some such statement as this: "Season 1925-26; *sardars* sent recruiting, 17,123 coolies; coolies recruited 10,374." It seems to me these coolies are recruited from those that are sent by the *sardar*?—The coolies are recruited by the *sardar* and sent through the agency, which is the Tea Districts Labour Association, and we have to pay them Rs. 15 for every coolie towards upkeep of the Association.

27303. Do you suggest that the restrictive legislation passed by the Government of India has in any way hampered the operations of the tea industry?—No, I would not say that; but it has prevented expansion.

* Vide Appendix I.

† Vide Appendix II.

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27304. Is expansion desirable in the tea industry at the present moment?—Personally, I should say, no for myself; but for the country, certainly yes. It might reduce our profits for a year or two, but eventually I think India could drink much more tea than it does.

27305. You think the demand justifies further expansion?—Certainly; I am not talking of the prices at this moment, they are rather low; but generally, yes.

27306. On page 210 you say that the moneylender is generally the local *kyah* or shopkeeper and further down on the same page you say that his rate of interest varies from 37½ to 150 per cent?—Yes; it is from 2 pias in the rupee to 2 annas.

27307. Do you have shopkeepers in the tea estates? By whom are they settled?—We have one or two shopkeepers in each garden; it depends upon the size of the garden.

27308. They are allowed to come there and open their shop by the tea estate?—Yes.

27309. On what conditions do they settle down there?—They pay a nominal rent.

27310. You have no control over them?—I have; they dare not charge interest from my coolies. I have, of course, referred to the case of ryots in my note.

27311. Your coolies have no transactions with them?—No; if we hear of any extortion, we sack the *kyah*.

27312. Are you aware of the basis of the transactions which pass between the coolies and the shopkeepers?—I have known coolies borrowing money from the shopkeeper.

27313. On what rate of interest?—Up to 2 annas in the rupee; that comes to 150 per cent.

27314. So, the coolies borrow money from the shopkeeper?—I have known it. Of course, we pay our coolies every week and therefore they are not in need of borrowing money. In the old days, when we used to pay them at the end of the month they used to borrow money.

27315. *Dr. Hyder*: How long is it since you have started paying them weekly?—We started this weekly payment system about a year and a half ago.

27316. *Prof. Gangulee*: So, the arrangement of paying weekly wages has reduced the indebtedness?—Yes; but you cannot reduce the indebtedness of the ryots and I am here talking of the ryots. Of course, the weekly payment to our coolies has certainly stopped the borrowing of money from these *kyahs*. If the *kyahs* try to lend money, they will be turned out.

27317. Is this system of weekly payment followed in all your tea gardens?—Yes.

27318. With regard to the education of the children of the coolies in the tea gardens, I heard in Calcutta that you were offering a compensatory allowance to induce coolie children to attend schools; is that practice in operation now?—We all have schools, but children go for a few weeks and then leave off going. They prefer to pluck tea leaves with their mothers.

27319. Do you offer compensatory allowance for each child?—The mid-day free meal provided by the garden to non-working children might be used in this manner. Personally I provide the free meal to all non-working children independent of attendance at school. Schools are not popular with coolie children or their parents. A common excuse for non-attendance is to complain against the schoolmaster. I have changed numerous schoolmasters but the children got tired of school in no time and I have found it no good.

27320. You could not influence the parents of these children?—Some thirty or forty children do go to the schools. I have seen twenty children in one school, but they never exceed that number. They do not stay for long. We are dealing with "Free Labour".

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27321. So there is an effort on your part to induce the coolies on your tea gardens to send their children to school?—Yes, we supply schools and schoolmasters for them but I do not go and fetch them out of the lines; I have done it occasionally.

27322. *Mr. Culbert*: With regard to this question of weekly payment of wages, is it now generally done on the tea estates?—Some estates pay fortnightly but I think weekly payments will become general. It seems rather popular now and I am very much pleased with this system.

27323. Does it cost you much?—It is more troublesome because I have to fetch the money from the treasury four times a month instead of once or twice.

27324. Does it not involve more labour for keeping the accounts up to date?—The labour is cheap in that respect. I would not put any extra expense on that score; I am very keen on it.

27325. You think it has really removed the cause of borrowing?—Certainly. In the old days when the coolie used to get his monthly wages he used to spend it quickly and used to borrow money for his drinks on Sunday nights. There is no necessity to borrow money now because he gets his payment on Saturday night or Friday night and he is in a position to pay for his drinks.

27326. That is exceedingly interesting. There was a resolution in the Assembly and we could not persuade the Government of India to agree to the payment of weekly wages?—We have done it and I like it.

27327. Your experience confirms the experience of England and most other European countries that the weekly payment system is the best from the labourers' point of view?—Yes. The spendthrift has always got only a little by him.

27328. *Dr. Hyder*: The Railways refused to pay weekly wages because they said it taxed them too much to introduce that system?—I have no experience of Railways.

27329. *Mr. Culbert*: With regard to the question of those who grow two crops and are unable to market their produce, I suppose you mean the surplus produce which is not a very large fraction of the total?—It is not at present.

27330. The average holding is from three to six acres, so that the man usually has a small fraction of surplus produce?—At present it is so. The usual practice is to reckon that a man and his wife require one maund of rice per month; 18 maunds of paddy, or 12 maunds of rice, per *pooruk* is the average yield; so you can soon calculate and find out the surplus.

27331. I do not quite understand why the difficulty of marketing a small fraction of the total produce should deter him from growing the other portion?—If he grew more, how would he get rid of it; he could not eat more.

27332. Cannot he consume more?—No.

27333. Does the export duty on tea have any effect on the price obtained for tea for internal consumption?—I do not think it has and I do not know how it can have any effect. The export duty is on tea we ship to London; on the tea sold in Calcutta there is no export duty.

27334. This export duty does not make you sell internally at a lower rate?—No.

27335. If you are paying an export duty, you are thereby losing to that extent the advantages gained from the foreign market?—We lose on that account in cash, so, it does interfere with our profits. We have been having two or three good years but they are coming to an end now.

27336. As far as the bringing down of the price of tea for internal consumption is concerned, it will have no effect?—I do not think it will.

27337. *Dr. Hyder*: Do you not enjoy Imperial preference to the extent of two-thirds of a penny through the United Kingdom?—I cannot answer that question; I am not a politician.

27338. It is a matter of your getting hard cash from the United Kingdom?—Personally I am not fond of any protection.

27339. *The Chairman*: Are you familiar with the facts of the case?—I know that Java has to pay a little more import duty than we do.

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27340. *Dr. Hyder* : You get 8 pies a lb. and pay 3 pies a lb. here.

27341. *Mr. Calvert* : Could you tell me how much it costs to transport 100 lbs. tea from your garden to Calcutta?— I could not tell you at the moment.

27342. Cannot you say roughly?—I have no idea.*

27343. Could you say what proportion of the total produce in Assam is exported?—I have not got a figure; I can get it for you.†

27344. The incidence of the export duty depends on the proportion of the tea which pays the duty to the total tea produced. Your internal consumption, I gather, is going up very rapidly?—We are doing our best in the way of propaganda. I think we have sold this year only 10 million lbs.

27345. It has gone up from 18 million lbs. to 50 million lbs.?—That is for the whole of India. We are spending a good bit on it. I have no doubt that the consumption of tea will go up because the Indian likes it.

27346. You suggest that one effect of this export duty is that it prevents the Government of Assam from taxing the tea industry for the benefit of the Province?—I said it was a severe handicap. We are so badly handicapped that the Government of Assam cannot get what they deserve to get.

27347. Is it not because the Government of Assam underassessed you originally and therefore left a margin which the Government of India could assess?—No, that is not the case. In the 'nineties' when I came here we could not make any money. I have struggled for 32 years, but to-day I have not got enough to live on.

27348. There must have been a margin somewhere, otherwise the Government of India could not have done it?—During the War there was.

27349. Is it your experience that the moneylender is advancing more money nowadays?—I think the cost of living has gone up but I cannot say if the poor ryot is getting much more for his crop.

27350. Generally speaking, the cost of living has gone up?—The price of rice has gone up and the price of *ghi* and other articles has also gone up. I consider the ryots to-day worse off than they ever have been in my experience.

27351. Is there any mule-breeding here?—No.

27352. Is there any scope for mule-breeding?—I have never tried it.

27353. Your difficulties of transport on account of bad roads would be considerably reduced if there were mule transport?—The elephant is the only animal suitable here and we are not allowed to catch him.

27354. *Rai Bahadur R. M. Das* : On page 211, you say, "Grazing areas are insufficient, badly distributed and the pastures very inferior, frequently consisting of plots of waste land not required for any other purpose." I want to ask if, during the present settlement operations, the ryots should approach the Government and ask for a plot of land to be reserved for forage at a low rate of interest? What do you think of this idea?—I should say that you should treble the grazing grounds. The difficulty is that you want to get hold of the land in a block in each village and no one will give up the land. I have handed over three grazing blocks. The only thing I can say is that this problem of grazing grounds is going to be a very serious one in the future.

27355. You know there are several classes of waste land in Assam. If, in future settlements, Government were to make it a rule that a man having three acres of land for cultivation must set apart one acre for forage, do you think that would be a feasible proposition?—If it could be organised.

27356. Could it be enforced?—I think it would be a very sound policy indeed.

27357. Do you think your *gaonbura* would be able to enforce it and to see that the land set apart for grazing purposes was not used for paddy cultivation or for any other purpose?—It would have to be demarcated

* Note by the witness.—It is Rs. 2-0-6.

† Note by the witness.—85 per cent of the tea grown in Assam is ultimately exported to the United Kingdom and elsewhere.

as Government grazing ground. During the War a lot of grazing land was taken up for sugarcane cultivation. I know of two grounds that were partially spoiled by them.

27358. Do you think your *gaonburas* will be able to prevent such lands being used for other purposes?—I would not trust them very far; you really want travelling Inspectors for animal husbandry to help the ryots.

27359. You think it is desirable?—It is most desirable.

27360. You say that fish culture should be encouraged. You know there is a Department of Fisheries in Assam?—Yes.

27361. Are you aware of the activities of that department?—I do not know much about it.

27362. Do you think that the Department of Fisheries should encourage fish culture by supplying fry to cultivators?—The fry are already there, what happens is that they are destroyed every year; it is no good putting them in the river if someone poisons them.

27363. So, Government should take measures to prevent poisoning?—Yes.

27364. *Sir Henry Lawrence*: You said the coolies spend money on drink. Do they spend all their surplus cash on drink?—No; some drink more, some drink less. They would not have been settled so numerous in this Province if they had spent all their surplus money on drinking.

27365. You do not mean to suggest that drink is a serious evil amongst your tea coolies?—I have known of cases of excess on occasions but it is very difficult to check. Occasionally there are rows on account of drink.

27366. Some particular sections of your coolies drink more?—The best coolie is the biggest drinker. The Santhal coolies are the greatest drinkers and they are the best coolies. In my opinion, drink and work go together. I have had experience for a good many years.

27367. *Dr. Hyder*: Have you got enough post offices on the tea estates?—We generally subsidise our own post offices.

27368. Instead of having these shopkeepers, cannot you organise retail co-operative societies?—Once I put Rs. 100 into a society and I got all my assistants to support it, but it failed and we lost our money.

27369. Have you got any banking facilities by which the coolies can deposit their surplus savings?—I do not think we have. I have heard that they have commenced a bank but they do not always trust the management. They send a lot of money home through the post offices. Rupees 3,000 per week is the remittance through our post office.

27370. Is that from one tea estate?—Yes; I have got four gardens.

27371. *Mr. Hazlett*: Would you as a businessman plant a tea garden on paddy land?—No.

27372. Paddy land is quite distinct from tea land?—Tea land can be made into paddy land by bunding, but you cannot make paddy land into tea land. Tea lands want too much slope, for instance. I have known small pieces of paddy land planted with tea but they have not been a success.

27373. *Sir Thomas Middleton*: Do you keep many cattle of your own?—We do; we have about 800 cattle.

27374. What do they cost you?—We cannot get them easily; some come round for sale. The traffic in cattle from Manipur which formerly existed has now been stopped, so they are generally purchased locally. The coolies buy their own cattle and we supply them with grazing grounds.

27375. What is the cost of a small bullock in your district?—The bullocks which are about the size of Manipur bullocks cost about Rs. 70 or Rs. 80 per pair. The price of the smaller ones which the coolies use for cultivation runs from about Rs. 28 to Rs. 35.

27376. Are the larger bullocks suitable for cartage?—No; such animals cost us Rs. 200 per pair; I bought some only last week.

27377. Where do these high-priced animals come from?—They are imported from the North-West.

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27378. What kind of grain do you give them when they are in hard work?—We require two grass-cutters for about four pairs of bullocks and then I give them about two seers of *kalai dal* which is something like small peas.

27379. *Prof. Gangulee*: You referred to coolies who cultivate their own land. Do you give any land to permanent coolies?—We give about 300 acres for each garden.

27380. You distribute that area among your permanent labour force?—Yes.

27381. On what basis?—They are supposed to get an acre per family. Frequently when the father dies, the sons get the father's land. But we try to give one acre of paddy land to each household.

27382. Do you take any rent from them?—We charge them one rupee per acre which is a nominal rent.

27383. Is there a toddy or drink shop in every estate?—There are no toddy shops; we do not encourage them in the habit of drinking.

27384. Where do they get their drink from?—They make their own and they also buy some from Government liquor shops. They make rice beer.

27385. *Dr. Hyder*: Is that illicit distillation?—I suppose so (there is no rule against home brew for personal consumption).

(The witness withdrew.)

The Commission then adjourned till 3-30 p.m. on Sunday, the 19th December, 1926.

APPENDIX I.
Efficiency as judged by percentage of daily attendance.
(January to October 1926.)

	Angoorie.				Boibam.				Hulwating.				Tiphook.			
	MEN.	WOMEN.	CHILDREN.		MEN.	WOMEN.	CHILDREN.		MEN.	WOMEN.	CHILDREN.		MEN.	WOMEN.	CHILDREN.	
1926.																
January ..	82	59	76		83	53	63		77	70	87		81	81	87	
February ..	78	57	78		86	63	70		77	70	87		90	80	89	
March ..	82	59	75		84	64	70		73	64	79		88	76	84	
April ..	82	55	75		83	62	68		71	72	80		85	72	89	
May ..	83	59	75		83	53	65		70	73	77		86	72	81	
June ..	80	65	76		83	66	67		68	73	78		83	78	79	
July ..	78	65	76		81	68	69		69	66	74		81	72	83	
August ..	69	52	83		76	61	71		54	59	78		74	72	79	
September ..	74	56	71		79	62	72		57	64	76		85	72	86	
October ..	79	59	72		81	63	71		71	72	78		85	76	84	
Total ..	780	666	732		810	637	685		684	683	784		848	751	841	
Average percentage ..	79	58	73		82	64	69		68	68	79		85	75	84	

APPENDIX II.

Average monthly family earnings.
(ONE MAN, ONE WOMAN AND ONE BOY.)
(January to October 1926.)

	Amgoorio.	Borbain.	Hulwating.	Tiphook.
1926.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
January	23 10 8	28 1 8	28 11 5	24 15 9
February	27 1 11	27 14 10	26 13 8	26 7 10
March	30 15 10	29 12 3	30 0 9	26 14 4
April	29 2 11	28 6 6	32 5 10	28 12 2
May	34 14 1	33 1 7	30 0 8	31 5 1
June	43 13 2	47 12 7	45 5 7	38 6 4
July	40 4 1	42 15 1	47 13 8	30 11 7
August	47 13 2	46 13 11	38 15 1	33 15 5
September	36 13 11	41 15 0	41 6 11	31 4 7
October	31 10 1	33 11 10	24 8 2	26 15 5
Total ..	346 3 11	360 0 9	352 1 9	300 0 4
Average monthly income ..	34 9 11	36 1 0	35 3 5	30 0 10

Mill worker, Sholapur, Bombay—

Average monthly income (family of 4·8 persons) RS. A. P.
(Labour Gazette, Bombay, for August 1926.) 42 15 2

APPENDIX III.

Cost of living for August 1926 (the most expensive month of the year.)

Daily allowance for one person—

	RS. A. P.	RS. A. P.
Rice 14 Chhatkas at Rs. 8 per maund.	0 2 9	
Dal 2 .. at Rs. 10	0 0 6	
Potato 2 .. at 3 annas per seer.	0 0 4	
Salt 1 Chhattak at 1 anna ..	0 0 2	
Mustard oil	0 0 3	
Spices	0 0 3	
Total ..	0 4 3	Monthly 7 15 6

* Extra per month (for man and woman)—

	RS. A. P.	
Kerosene oil	0 6 0	Average per head, monthly 1 2 0
Tobacco	0 6 0	
Pan	0 8 0	
Fish or meat	1 0 0	
	2 4 0	

* Vide next page.

Mr. W. G. McKercher]

* For man per annum—

		RS.	A.	P.	RS. A. P.
4 Dhutis ..	at Rs. 1-12.	7	0	0	
4 Half coats ..	at Rs. 1-2.	4	8	0	
1 Blanket ..	at Rs. 2.	2	0	0	
2 Puggrees ..	at Rs. 1.	2	0	0	
Barber monthly ..	at As. 3.	2	4	0	
For women—					
4 Sarees ..	at Rs. 2 14	11	8	0	
4 Jackets ..	at As. 15	3	12	0	
1 Blanket ..		2	0	0	
Total ..		35	0	0	
Average ..		17	8	0	
					Average per head, monthly. 1 7 4
					Total monthly .. 10 8 10

* Not included in above—

	RS. A. P.
Cost of family (infants and dependants).	
Pooja expenses	
Liquor	
Opium	
Household goods—Pots and pans, etc.	
Mill worker, Sholapur, Bombay—	
Average monthly cost (family of 4-8 persons).	40 0 11
(Labour Gazette, Bombay, for August 1926.)	

APPENDIX IV.

Statement of expenditure for recruiting a labourer.

For Sardar—					RS. A.
Cess to the local Government ...	...	...	...	...	3 0
Food expenses attending court for registration ...	...	...	...	...	0 8
Railway fare and food expenses to Goalundo Depot paid at the garden (not included in bills).	...	...	...	...	8 6
Indian State's capitation fee on Sardar ...	...	...	...	...	15 0
Tea District Labour Association capitation fee on Sardar.	...	...	...	...	5 0
For Emigrant—					
Indian State's capitation fee ...	...	...	...	...	5 0
Assam Recruiting Protection Board cess ...	...	...	...	...	3 0
Tea District Labour Association capitation fee ...	...	...	...	...	15 0
Bonus for debts ..	...	...	...	...	5 0
Bonus on arrival ..	...	...	...	...	5 0
Clothing ...	...	...	...	...	12 8
Food on journey ...	...	...	...	...	2 8
Forwarding and railway fare ...	...	...	...	...	52 0
Sardar's expenses in recruiting districts ...	...	...	...	...	50 0
					181 14
Commission to Sardar paid at the garden ...	...	...	...	...	20 0
Total					201 14

NOTE.—The above figures represent the cost of one Sardar recruiting one working adult from Mouzbhunj district.

For districts situated farther a-field from the labour districts, the railway fare and food expenses increase with distance.

The average recruitment works out rather below one working coolie for each Sardar sent down to the recruiting districts.

Expenditure on recruitment is further increased by—

(a) Loss of the recruiting Sardar's work to the garden generally a period of 4 to 6 months.

(b) Sardar's failing to recruit labour.

(c) Recruitment of non-working dependents.

(d) Repatriation expenses.

Mr. W. G. McKercher]

Sunday, December 19th, 1926.

JORHAT.

PRESENT :

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir THOMAS MIDDLETON, K.B.E., C.B.	Mr. H. CALVERT, C.I.E., I.C.S.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.	Professor N. GANGULEE. Dr. L. K. HYDER.

Mr. J. HEZLETT, I.C.S.	} (<i>Un-opted Members</i>).
Rai Bahadur RAMANI MOHAN DAS.	
Mr. J. A. MADAN, I.C.S.	} (<i>Joint Secretaries</i>).
Mr. F. W. H. SMITH.	

LUZSKU SEMA, representing the Sema Nagas.

Oral Evidence (Mr. K. Cantlie, I.C.S., interpreted.)

27386. *The Chairman* : Luzsku Sema, the Royal Commission are glad to see you, and we hope you will be ready to answer our questions. By what class of cultivation do you and the people in your village live?—By *ghum* cultivation.

27387. With movement every three years, or how often?—The proper system of *ghum* cultivation should be cultivation after every twelve or fifteen years by two years at a time, but we are forced to do it after three years.

27388. Coming back to the same ground every three years?—Yes,

27389. Cutting out the jungle, two years' cultivation, three years' interval and then returning; is that the position?—Yes.

27390. That is your whole livelihood?—That is the general way in which the Semas gain their livelihood, but in my village they have introduced terrace cultivation, with the assistance of Government.

27391. What has been your experience of that terrace cultivation?—We like the terrace cultivation very much, and it has been of great benefit to us. Both we and other Sema villages would extend it greatly, but the trouble is that we cannot afford to pay the labourers to help us in constructing the terraces.

27392. Do you require advice as to how to construct the terraces?—There are two Sema instructors employed by Government to teach terrace cultivation. They teach about six Sema villages. We would like to have more instructors from Government.

27393. Are these terrace lands irrigated?—They are irrigated by the digging of ditches.

27394. Where does the water come from?—It is taken from the hill streams.

27395. Are they dammed for the purpose?—Yes.

27396. Do you require skilled advice in the matter of these minor irrigation schemes?—Yes, skilled advice is necessary for their construction.

27397. You referred to the necessity for hiring labour. Is it not within the capacity of the villages concerned to provide the necessary labour?—The Government pays us 2 annas daily for each labourer, but we have to pay 4 annas daily and provide them with their food in addition. All the people of a village will not join together to cultivate; each man will cultivate his own particular piece of the terrace, and each man pays for the labour to assist him at the rate of 4 annas and food. We only get 2 annas from Government, and that is the cause of the trouble.

Luzsku Sema]

27398. It is your view that the village itself, without outside assistance, is not capable of providing the necessary labour?—Without outside help the villages are not able to adopt terrace cultivation, as each man is too poor to engage outside help and the labour required to make the terraces is too vast for one man to undertake alone.

27399. If sufficient terrace land could be provided, would the villagers forego *ghum* cultivation altogether?—If there were sufficient terraces it would not be necessary to *ghum* for rice, but for Job's tears and various kinds of millet we would still retain our *ghum*.

27400. There is no likelihood of your doing without *ghum* altogether provided sufficient land were under controlled cultivation?—Millet does not grow well under irrigated cultivation, owing to there being too much water.

27401. If you had cleared unirrigated land, could not you cultivate it year by year, as other people do?—We have no flat land in the hills; it is all on a slope, and it is not like the land in the plains. The land is stony and the soil is poor, so that we could not produce crops on it year by year. We do not use manure, except wood-ash, for the *ghum* cultivation, nor do we use manure for the terrace cultivation. The Angamis, on the other hand, do use manure.

27402. Do you use manure of any sort?—No. We do not burn our rice stubble, but hoe it in; that is all.

27403. Do your people borrow money?—Yes. There is a lot of borrowing and lending in the Sema villages, and the poor men are greatly in debt.

27404. Is most of their trading carried on on a money basis, or by exchange and barter?—The use of money is general nowadays; if a man buys pigs or cattle he pays money for them.

27405. What are your principal crops?—Rice, Job's tears, two kinds of millet and sesamum.

27406. Any chillies?—Yes.

27407. Do you grow the potato?—The Angamis grow potatoes, but we do not. We also grow onions and various other vegetables and gourds.

27408. Why do you not grow potatoes?—We do not know how to do it.

27409. Would you like to learn how to do it?—The Angamis, who grow potatoes, say it is a very troublesome and risky crop, requiring a great deal of manure and labour.

27410. But the Angamis go on growing it, in spite of these difficulties?—Yes, in certain villages.

27411. Do your people get much food out of the jungle in the way of wild fruits, roots and the like?—We get arum and other roots, yes.

27412. Are there any other matters about which you would like to tell the Commission?—We want this kindness from the Commission. Nowadays the Government forbids us to take heads and kill one another, and our numbers have become larger, so that we have not enough to eat. By extending terrace cultivation, we could get sufficient food to live. We would ask the Commission to help us to extend it. That is all we ask.

27413. Sir Thomas Middleton: Is rice grown on the *panikhot* as productive as rice grown after *ghumung*?—The terrace cultivation rice is better than the *ghum*-rice.

27414. For how many years have you known terrace rice?—Ever since I was a small boy, twenty years ago.

27415. Are the crops of rice as good on these fields now as they were when you were a small boy?—We have found that on some plots where the rice has been sown year after year it deteriorates, but we hoe the land well and this seems to provide a remedy.

27416. Have you any cattle?—We do not, as a tribe, drink milk, but we keep cattle, cows, pigs, fowls and *mithans*.

27417. Do you collect the manure of your animals for your rice fields?—We collect it, put it outside the village and let it stay there; we make no use of it.

27418. Not even for millets?—No.

Luzeku Sema]

27419. Why do you make no use of it? The plains people do?—Our neighbours the Angamis use manure, but they keep cowherds who go after the cattle and pick up the manure for use on the fields. We do not keep cowherds, so we lose the droppings of the animals in the jungle.

27420. You do recognise it is a loss?—We do not know enough about it to be able to say whether manure is good.

27421. With regard to the cultivation of millets and Job's tears, the former practice was to *jhun* after about twenty years, but now you have got down to *jhuming* after three years. What is the result of that shortened period on the millets?—The result of cultivating again after three years is that the millet is short in the stem and the seed is small. Moreover, the quantity of the seed is less.

27422. Is it as easy to prepare the soil properly for sowing after three years' *jhuming* as it is after twenty years?—It is much easier, because there are not so many trees; but the product is much less.

27423. Does the seed often fail after the three years' *jhuming*?—Yes, it sometimes fails entirely.

27424. Is that dying off more likely to occur after the three years' than after the twenty years' *jhuming*?—Yes. After three years it sometimes fails entirely, whereas with twenty years it does not.

27425. You yourselves do not drink any milk, but do you give milk to your children?—No.

27426. For how long do the mothers nurse the children?—From a year to eighteen months.

27427. After that, what food do you give the children?—They eat rice and *naga dal* and sometimes chickens.

27428. Is the rice semi-digested for them by the mother by chewing?—Yes, the mothers chew the rice and give it to the children.

27429. For how long does that go on?—For about eight months. The day after birth they get a little rice.

27430. Mr. Hyder: You complain of shortage of labour. Cannot your women help you in the construction of these *hunds* and in your cultivation generally?—There are difficulties in the way on account of tribal customs. After the land has once been cut for *jhun*, the women prepare the land the second year for the *jhun* while the men cut fresh land. The women do help the men in agriculture, but making *panikhat* is very hard work and would be considered improper for women.

27431. Since the *Sarkar* stopped head-hunting, is infanticide practised to keep down your numbers?—I do not know of any practice of infanticide amongst the Semas.

27432. What objection have you to coming down to the plains and working in the tea gardens?—Many of us come down every year to work in the tea gardens in cutting jungle, but we do not do hoeing; that is not our custom.

27433. To what is your indebtedness due?—If a poor man has not enough land, or his crop is poor and he does not get enough to eat, if the rich men did not lend him some money, how would he live?

27434. What is the price of a bride?—Amongst the Semas it is a *mithun*, which is an enormous ox. It used to be worth Rs. 40, but now we have to pay Rs. 100 to Rs. 150 as the price of a bride. The Angamis give a pig for the bride; the Ithotas give up to Rs. 200.

27435. Mr. Heslett: How many Sema villages have actually taken up terrace cultivation?—Six.

27436. Is the cultivation gradually extending every year?—Yes, it extends somewhat every year.

27437. Sir James MacKenna: If Government gave 4 annas per labourer per day, would the practice of terracing extend?—If the Government gave 6 annas a day, I am certain it would greatly extend, but even 4 annas should relieve the situation. The labourers eat four times a day when they are at work, which makes it very expensive for their employers.

27438. What is the crop most frequently encountered in *jhumed* areas?—Our staple food is rice, so it is mostly rice.

[*Tuzoku Sema*]

(The Interpreter: I think it varies according to the altitude of the different villages; some of the land in high cold places cannot grow rice at all.) We make beer from millets.

27439. Do you export any of your produce?—The Semas are not traders.

27440. Prof. Gangulee: Do you weave your own clothes?—Yes. We do not know how to spin properly, so we buy the thread; but we do the weaving.

27441. Where do you buy the yarn?—From the Angamis and Aos.

27442. Do you grow any cotton?—No. The neighbouring tribe of Lhotas do, but we do not.

27443. Do you weave your own blankets?—Those who have gone to do coolie labour anywhere like to purchase a blanket, and they are the people who have blankets. Other people do without; they use their own cloths.

27444. When you have dealings with neighbouring tribes, what is your means of exchange barter?—The villagers across but near the frontier will take money, but those further away do not understand money; some of them on getting a rupee, make a hole in it and wear it round their necks.

27445. Mr. Calvert: With regard to debt, who lends the money?—I and my father are chiefs, and we lend money to our men in the villages when they need it.

27446. If a borrower defaults in repayment, what do you do?—If a man dies, his son will take over the burden.

(The Interpreter: Not very long ago they used to take the borrower as a slave. I do not think the practice lingers now, but in the old days a man would sell himself to work for the money-lender.)

27447. Rai Bahadur R. M. Das: Are there any schools in your villages?—In the Angami country, there are several schools, including a middle English school and Missionary schools. In the Sema country, there is one school, which has been open for six years, and there we learn the Sema language.

27448. Would you like to educate your children?—Though I am married, I have no children.

27449. Would your relatives like to?—Some boys would like to learn when they are young, and the parents are quite ready to give them education, but during the years of education they have to feed them without getting any return from them, so that people are not very keen about it.

27450. Is education in the Government and Missionary schools given free?—I am not sure. In Missionary schools, there are no fees, but the boys have to work. I do not know about the Government schools. In the middle English school, I believe they take fees but not in the village schools.

27451. The Chairman: Do many of the young men of your tribe go over the border in these days?—Yes, the young men do go.

27452. With what object?—There are generally wars with different villages in progress, so that sometimes we go to a particular place and sometimes we do not.

(The witness withdrew.)

(The Commission then dispersed for the Christmas holidays and resumed its sittings at Dacca on the 5th January, 1927. For evidence at Dacca see Volume IV.)

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GLOSSARY

Agar	An essential oil of the ' Agar ' tree (<i>Aquilaria agallocha</i>).
Aratdar	Seller of commodities on behalf of the growers and of middlemen with godowns for hire for storage of goods.
Arhar .. ..	..	A variety of pulse (<i>Cajanus indicus</i>).
Aus (paddy) .. ..	..	Summer paddy, generally sown on high lands.
Bao .. ..	..	Paddy which is sown broadcast in April on land which is flooded in the rains ; reaped in December.
Bhadralog .. ..	..	Gentlemen.
Bidha .. ..	..	A form of harrow.
Bigha .. ..	..	One-third of an acre.
Bhil (bil) .. ..	..	Depression more or less permanently covered with water.
Boro (paddy) .. ..	..	A variety of rice transplanted in January from nurseries and harvested in March ; sometimes called spring paddy.
Bund .. ..	..	Dam.
Chamars .. ..	..	Workers in leather, one of the depressed classes.
Chowkidar .. ..	..	A watchman.
Chowkidaripanchayats.		Associations for keeping watch and ward in villages.
Chur (char) .. ..	..	Land newly formed by water-borne silt.
Dal .. ..	..	A generic term for food pulses.
Dhenki .. ..	..	Thrashing instrument.
Dhoti .. ..	..	The loin cloth worn by men.
Farin .. ..	..	A small dealer.
Gaonbura .. ..	..	Village headman (Assamese).
Gopals (Gorals) .. ..	..	Milkmen.
Gur .. ..	..	Unrefined Indian sugar.
Hat .. ..	..	A market place where local producers and consumers as well as traders meet once or twice a week for sale and purchase.
Howdah elephant .. ..	..	A trained riding elephant.
Jhuming .. ..	..	Temporary cultivation in jungle clearings.
Katta bombai .. ..	..	A variety of jute.
Khad .. ..	..	A water-course.
Khasmahals .. ..	..	Lands under the direct control of Government and let out by them to private tenants.
Khesari .. ..	..	A kind of rice (<i>Oryza sativa</i>).
Kurkani .. ..	..	Badly paid labourers (used in Assam).
Kurani .. ..	..	Literal translation of the word 'kurani' used as a temporary term for poor labourers in composition in Assam.
Kutchari .. ..	..	The office of a Government agent.
Kyah .. ..	..	Harwar (a class of menials) or 'traders coming from war'.